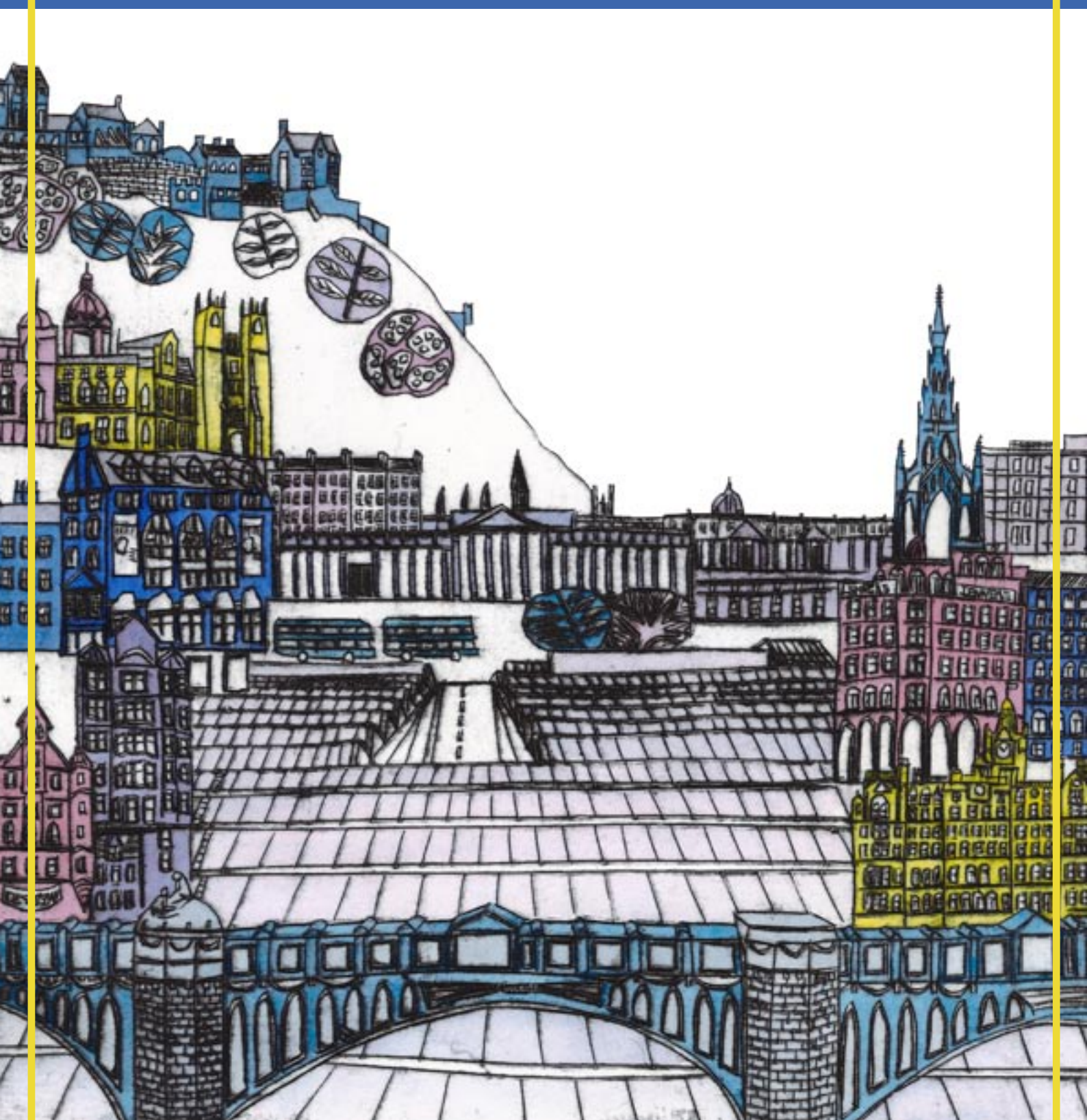




DESIGN TO THRIVE

FOUNDATIONS FOR A BETTER FUTURE



EDINBURGH: 3RD - 5TH JULY 2017
CONFERENCE PROGRAMME



PLEA has a commitment to the development and diffusion of the principles of bioclimatic design and the application of natural and innovative techniques for sustainable architecture and urban design.

PLEA serves as an open, international, interdisciplinary forum to promote high quality research, practice and education in environmentally sustainable design.

PLEA is an autonomous, non-profit association of individuals sharing the art, science, planning and design of the built environment.

PLEA pursues its objectives through international conferences and workshops; expert group meetings and consultancies; scientific and technical publications; and architectural competitions and exhibitions.



DESIGN TO THRIVE

FOUNDATIONS FOR A BETTER FUTURE

WELCOME!

PLEA is a global network that has led a worldwide discourse on architectural and urban design through its conferences since 1982. Originally focussed on 'Passive and Low Energy Architecture' the scope of its remit has expanded to encompass many different aspects of Low Carbon, Sustainable and Resilient Design for Buildings, Cities and Ecosystems. It has thousands of professional, academic, student and industry members from over 40 countries.

PLEA conferences are highly ranked, attracting academics, architects, engineers and planners with support from industry, cities and governments. Over 650 delegates are attending PLEA 2017 in Edinburgh. At PLEA 2017, world leading keynote speakers will address vital issues of the day on sustainable and resilient built environments.

PLEA 2017 is hosted and supported by a consortium of Scottish universities, the Scottish Government, the City of Edinburgh and Historic Environment Scotland. It features over 250 speakers from across the globe, site visits, extraordinary parties, and networking opportunities. We are set to have a stimulating time in the here and now with our eyes on a challenging future.

Our theme of 'Design to Thrive – Foundations for a Better Future' recognises the enormity of the local and global challenges we face in building and refurbishing our buildings, cities and societies to both to minimise climate emissions and to adapt effectively to climate change impacts in each of our own rapidly evolving economies, societies and physical infrastructures. Scotland and Edinburgh are hosting PLEA 2017 to learn from, and share, progress made here and elsewhere in building a more resilient country through new thinking in education, modern design, refurbishment of the historic building stock, energy and water systems, tools, technologies, materials and planning, design policies and demonstration projects.

PLEA 2017 takes place in the heart of Edinburgh's historic centre where the intellectual foundations for the 18th Century Enlightenment were laid. We will build on them, to create together an ideas-changing conference. Our debates at PLEA are sure to be 21st Century facing.

Professor Susan Roaf

Conference Convenor and Organiser

33RD INTERNATIONAL CONFERENCE ON
PASSIVE AND LOW ENERGY ARCHITECTURE
EDINBURGH: 3RD - 5TH JULY 2017

ORGANISERS



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Historic Environment Scotland (HES) is Scotland's public body charged by Scottish Ministers with the oversight and leadership of our historic environment, in all its forms. We care for a range of historic sites and buildings on behalf of Scottish Ministers and the people of Scotland. We are also the legislative body that has oversight and input on matters of planning and protected buildings and structures, and these roles are probably the ones that the public sees most of. However, there are many other activities and tasks that HES is involved with. We are not just concerned with castles, palaces and high status buildings, but with the rich texture of our heritage from traditional cottages to old harbours. Increasingly we are interested in supporting traditional trades and crafts associated with older buildings of all types, including what went on inside, how they were designed and how they were used. While we know that there are many improvements that can be made to older buildings, they can also teach us much in terms of passive design and function. The role of historic and traditional buildings in maintaining sustainable settlements of all sizes is well established and something that we are keen to showcase and demonstrate in this historic city. Through our support of PLEA 2017 we hope to assist speakers and delegates in appreciating and understanding these universal values.



The VELUX Group puts people first in the development of better living environments for all.

It is a fact that people in the countries where we are present, typically spend up to 90% of their time inside buildings in the countries that are relevant to us. In Europe alone, some 84 million people live in damp and unhealthy buildings, while 30 million people suffer from lack of daylight. At the same time, buildings consume huge amounts of valuable resources during construction and in the use phase. In fact, buildings account for 40% of total energy consumption and up to 50% of the total raw material use in Europe. In other words, buildings are key elements in solving the global challenges of health, resource scarcity and climate change. That is why we have made it our core business to help create healthy and sustainable buildings that balance care for people and care for the planet.

With our products and solutions, we want to create bright, healthy and efficient buildings in which people can live, work, learn and play. To do this, we take leadership in the quest to pioneer sustainable buildings, inspire the building community and challenge the framework conditions that govern the building sector.



The Potterrow Development for the University of Edinburgh ©Keith Hunter

BENNETTS ASSOCIATES

London
Edinburgh
Manchester

Bennetts Associates - combining sustainability with award-winning architecture for thirty years

From the foundation of the practice in 1987 Bennetts Associates has been driven by the idea that architectural excellence and high levels of sustainability are mutually supportive. Moreover, we have applied this to buildings of all kinds and scales, from offices to theatres, universities and historic conversions. With studios in Edinburgh as well as London and Manchester, we are delighted to support PLEA and to welcome all delegates to this incredible city.

www.bennettsassociates.com

Solar – it's all we do

...and all we've done for the last 38 years

AES Solar is passionate about working with designers and developers to drive home the message that solar systems do not have to be a last minute, optional 'add-on' and instead should be a key part of design and a real means of achieving affordable warmth and light in our homes and offices.

AES Solar has a desire to integrate solar energy and its storage into the fabric of a building and bring it into the heart of the design process. We believe this is the best way to achieve truly passive, low energy buildings.

AES Solar based in Forres, Moray was established in 1979, and was the first manufacturer of solar thermal collectors in Europe.



With that durable record in mind it is fitting that AES Solar steps forward to support PLEA 2017 where the art, craft and engineering of solar buildings will be explored and developed for the benefit of both current buildings and future generations.



Specialists in Solar PV and Solar Thermal

AES Solar
AES Building, Lea Road,
Forres IV36 1AU

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01309 676911

ORIENTATION

EDINBURGH

Edinburgh is the capital of Scotland, a city of buildings hewn from stone, spreading downwards and outwards from the iconic castle that dominates the landscape around. Edinburgh is one of the great cities of the world, not because of its size but because of its sheer beauty and timelessness. Buildings nearly a thousand years old merge seamlessly with those built a hundred years ago, or yesterday. Once visited, never forgotten and not to be missed. You will see it as few others can at PLEA 2017.

The city is also a vibrant home to modern culture: internationally famous arts, comedy, literary and film festivals, shopping for everything from the world's best luxury names, to goods made by local, independent Scottish talent; wonderful food from Michelin-starred restaurants to pop-up street-food vendors; parks and crags to play in and climb on, and views all around that delight and inspire. Edinburgh is also the home of our 'oft in the news' Scottish Parliament, Queen Elizabeth's ancient Palace of Holyrood and many different museums, galleries, events and visitor attractions for all ages.

- *Visitor information: www.thisisedinburgh.com*
- *Hop on hop off bus for city tours: www.edinburgh tours.com*
- *Panoramic views of the city from Calton Hill or Arthur's Seat*
- *The Edinburgh Rewards Passport in your delegate pack contains a city map, handy tips, and highlights city events, as well as offering generous discounts from over 100 participating businesses.*

GETTING AROUND

BY BUS

The central location of our venues on George Street means that it is well served by buses. Bus travel information can be found on the website: lothianbuses.co.uk. A single ticket for the city centre is £1.60 (the exact fare is needed when you travel). A day ticket for unlimited travel in the city centre is £4.00. There is a useful smartphone app which will help you travel by bus and can be used for ticketing.

BY TRAM

The tram route goes from the airport, along Princes Street to York Place. Our venues are about 5 minutes walk from the Princes Street tram stop. There are trams approximately every 15 minutes.

BY TAXI

Edinburgh has excellent and reasonably priced taxis. Try Central Taxis, telephone: 0131 229 2468. or City Cabs, telephone: 0131 228 1211

CONFERENCE ORGANISATION

The conference has been arranged into forums to initiate lively debate as we look in detail at some of the most fundamental questions we face today in our respective professions. There are 31 forums on wide ranging topics. The full details for each forum can be found in the listings contained in this programme. Fuller details, including those of individual presentations within the forums, are available on-line through the PLEA 2017 website. www.plea2017.net

There are six plenary sessions, led by 25 of the leading names in their fields, to explore problems and solutions posed by the built environment in a rapidly changing world.



OUR VENUES

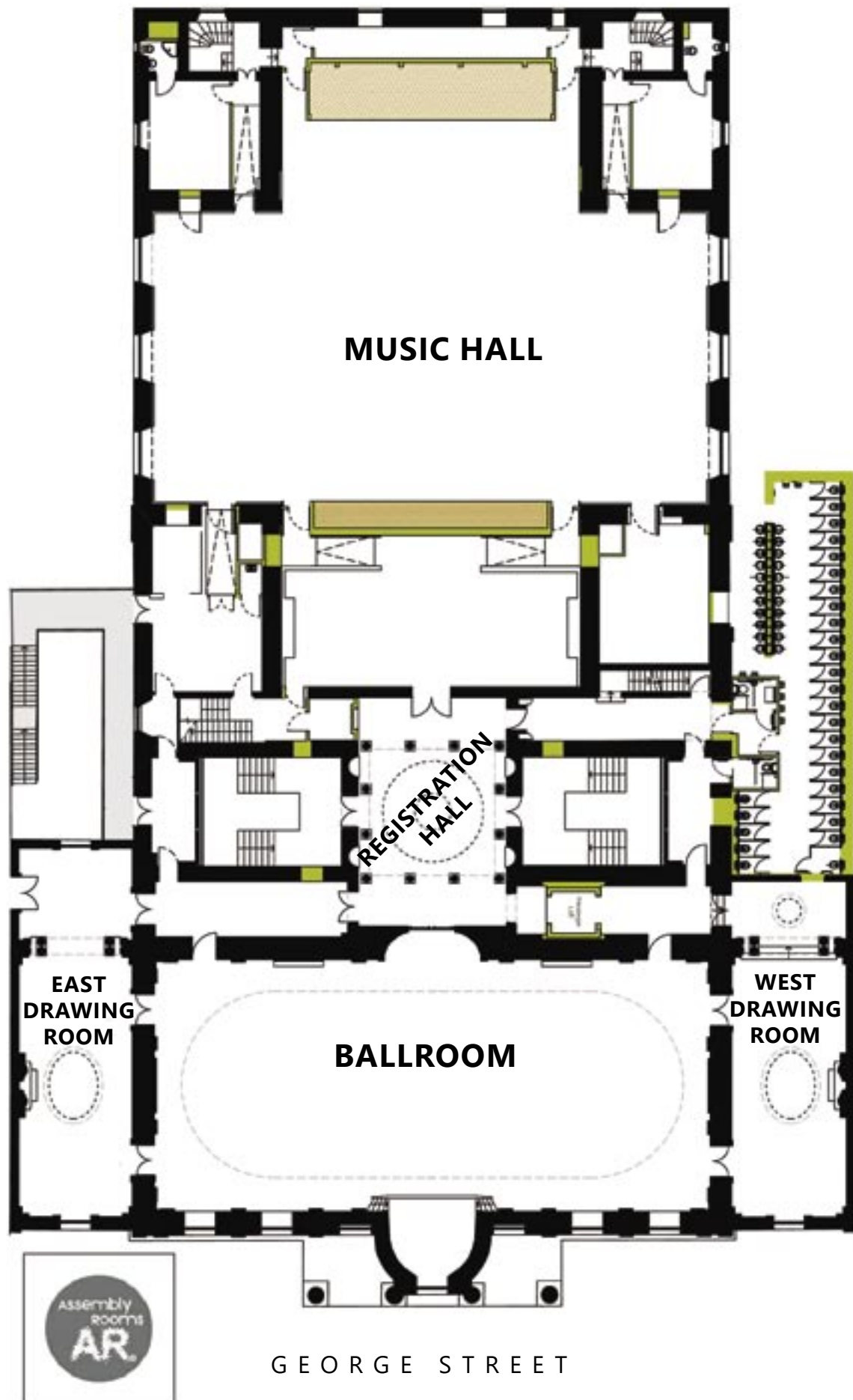
PLEA 2017 is offering an extraordinary opportunity to see Edinburgh as never before. Our conference takes place in two historic venues, the Assembly Rooms (1787) and the Royal Society of Edinburgh (1783). In these buildings people have met to discuss and resolve the great problems of their day since the 18th Century Enlightenment and we will carry on this tradition facing the future from a 21st century perspective. Our conference dinner is being held at the National Museum of Scotland.

THE ASSEMBLY ROOMS

The opening Plenary Session, Welcome Reception, Exhibition and many of the Forum Sessions of the Conference will be held in the Assembly Rooms in the heart of the 'New Town' in Edinburgh. www.assemblyroomsedinburgh.co.uk. The Assembly Rooms opened at the height of the Age of Enlightenment in 1787. It was funded by public subscription, costing over £6,000 on land donated by the town council. Designed originally by John Henderson, it was extended in 1818, with a grand portico added by architect William Burn. His partner David Bryce went on to design the Music Hall in 1843. PLEA 2017 will take place in its original Ballroom and Drawing Rooms and the Music Hall.



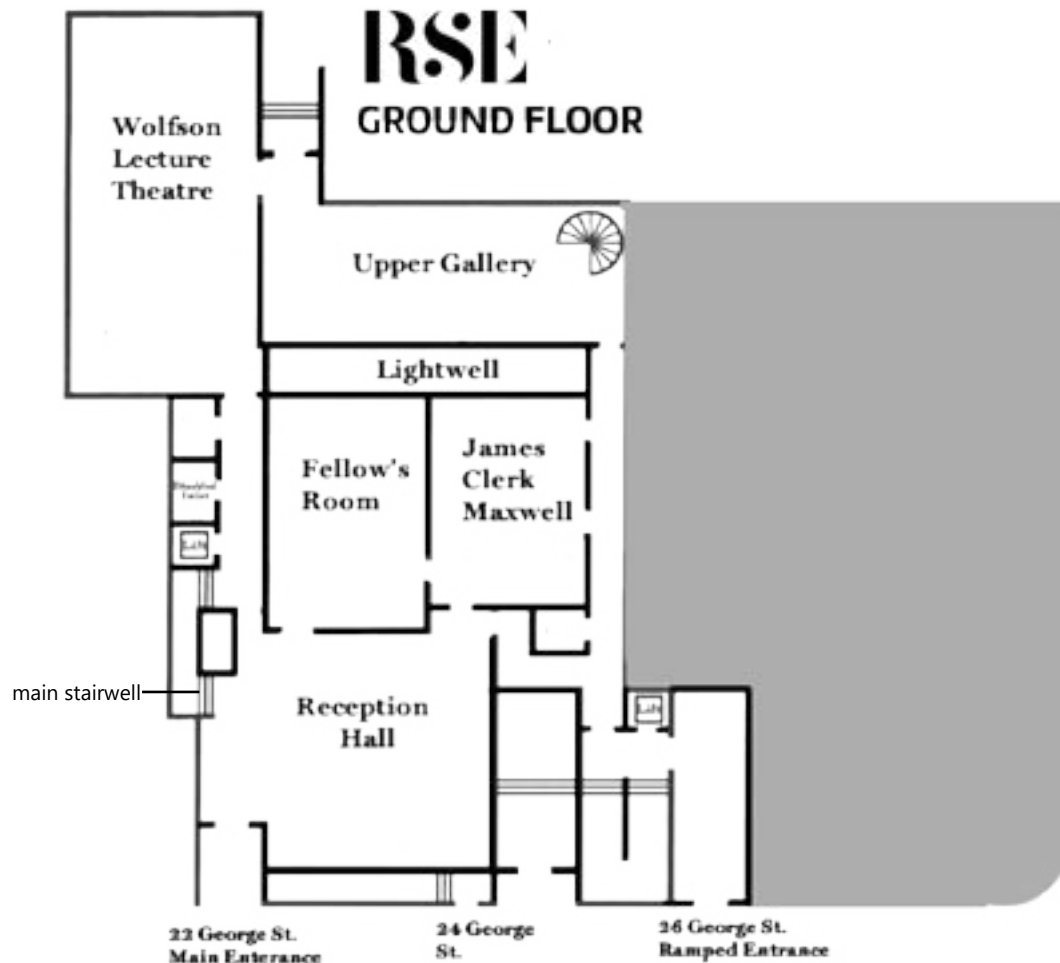
ASSEMBLY ROOMS, FIRST FLOOR





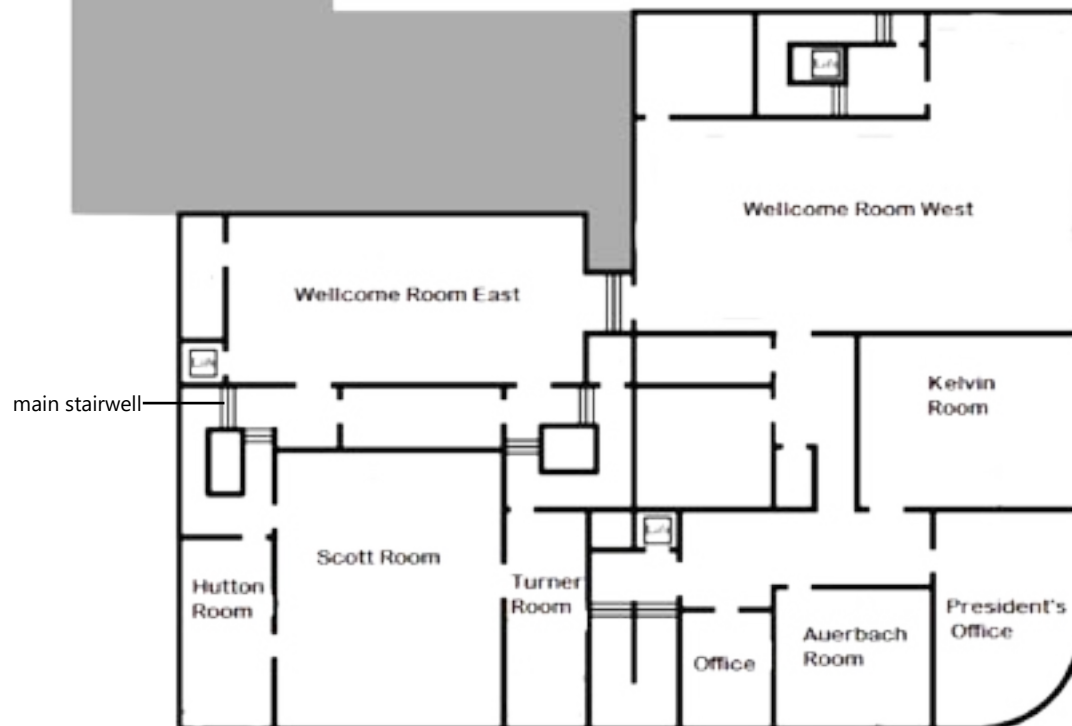
ROYAL SOCIETY OF EDINBURGH

At the start of the 18th century, Edinburgh's intellectual climate fostered many clubs and societies of which the most prestigious was the Society for the Improvement of Medical Knowledge founded in 1731. Its name changed over time and became the Edinburgh Philosophical Society and then finally the Royal Society of Edinburgh in 1783, issuing, in 1788, the first volume of its new journal Transactions of the Royal Society of Edinburgh. www.royalsoced.org.uk The RSE first occupied its current abode on George Street in 1810 and in its rich interiors many of the PLEA 2017 Forums and the Internet Café will be housed, while delegates are over seen by the portraits of people like David Hulme, James Hutton, Lord Kelvin, Walter Scott and James Watt.



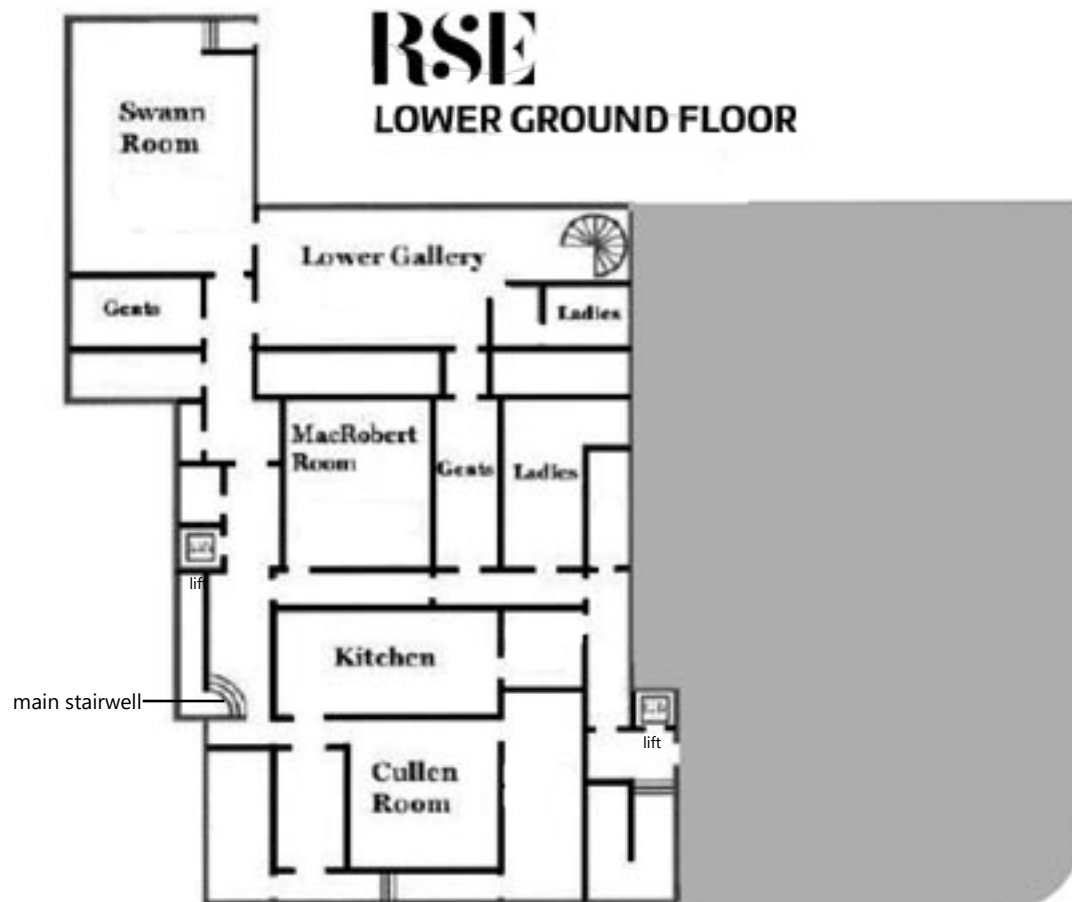
RSE

FIRST FLOOR



RSE

LOWER GROUND FLOOR



Session	Time	ASSEMBLY ROOMS				Wolfson Lecture Theatre
		Music Hall	Registration Hall	West Drawing Room	East Drawing Room	
	MONDAY 3rd JULY					
	10.00 onwards		REGISTRATION			
	13.30 - 14.40	PLENARY 1				
	14.40 - 15.20	BREAK				
	15.20 - 17.00	PLENARY 2				
	17.00 - 17.05	BREAK				
	17.05 - 18.00	PLENARY 2				
	18.00 - 20.00	RECEPTION IN THE MUSEUM				
	TUESDAY 4th JULY					
	8.30 - 9.30	PLENARY 3				
	9.30 - 10.00	BREAK				
A	10.00 - 12.00	FORUM 1: PCD		FORUM 2: CD	FORUM 6: EE	FORUM 8: BPE
		FORUM 1: PCD		FORUM 2: CD	FORUM 6: EE	FORUM 8: BPE
	12.00 - 12.30	BREAK				
B	12.30 - 14.30	FORUM 1: PCD		FORUM 2: CD	FORUM 6: EE	FORUM 8: BPE
		FORUM 1: PCD		FORUM 2: CD	FORUM 6: EE	FORUM 8: BPE
	14.30 - 15.00	BREAK				
C	15.00 - 17.00	FORUM 1: PCD		FORUM 2: CD	FORUM 7: LIT	FORUM 9: GI
		FORUM 1: PCD		FORUM 2: CD	FORUM 7: LIT	FORUM 9: GI
	17.00 - 17.15	BREAK				
	17.15 - 18.30	PLENARY 4				
	19.30 - 23.00	DINNER AT THE NATIONAL MUSEUM				
	WEDNESDAY 5th JULY					
	8.30 - 9.30	PLENARY 5				
	9.30 - 10.00	BREAK				
A	10.00 - 12.00	FORUM 1: PCD		FORUM 3: RSB	FORUM 7: LIT	FORUM 10: BTG
		FORUM 1: PCD		FORUM 3: RSB	FORUM 7: LIT	FORUM 10: BTG
	12.00 - 12.30	BREAK				
B	12.30 - 14.30	FORUM 1: PCD		FORUM 4: CE	FORUM 5: OH	FORUM 10: BTG
		FORUM 1: PCD		FORUM 4: CE	FORUM 5: OH	FORUM 10: BTG
	14.30 - 15.00	BREAK				
	15.00 - 16.00	PLENARY 6				

CONFERENCE SCHEDULE

1	PCD	Passive & Climatic Design	9	GI	Green Infrastructure
2	CD	Comfort & Delight	10	BTG	Bridging the Performance Gap
3	RSB	Renewables / Solar Buildings	11	UHI	Cool Cities & Urban Heat Islands
4	CE	Community Energy	12	ACC	Adapting to Climate Change
5	OH	Overheating	13	HVB	Historic & Vernacular Buildings
6	EE	Energy Efficiency	14	DD	Digital Design
7	LIT	Light	15	AD	Aesthetics & Design
8	BPE	Building Performance Evaluation	16	LCD	Low Carbon Design

CONFERENCE

ROYAL SOCIETY OF EDINBURGH					
Wellcome Room East	Wellcome Room West	Lower Gallery	Scott Room	James Clerk Maxwell Room	Swann Room
BREAK					
THE ASSEMBLY ROOMS BALLROOM					
BREAK					
FORUM 11: UHI	FORUM 13: HVB	FORUM 15: AD	FORUM 20: ET	FORUM 22: WW	FORUM 28 + 29
FORUM 11: UHI	FORUM 13: HVB	FORUM 15: AD	FORUM 20: ET	FORUM 23: SND	MAT + CA
BREAK					
FORUM 11: UHI	FORUM 13: HVB	FORUM 15: AD	FORUM 20: ET	FORUM 25: RAA	FORUM 28 + 29
FORUM 11: UHI	FORUM 13: HVB	FORUM 16: LCD	FORUM 20: ET	FORUM 25: RAA	MAT + CA
BREAK					
FORUM 11: UHI	FORUM 13: HVB	FORUM 16: LCD	FORUM 20: ET	FORUM 25: RAA	FORUM 17: CS
FORUM 11: UHI	FORUM 13: HVB	FORUM 16: LCD	FORUM 20: ET	FORUM 25: RAA	FORUM 17: CS
BREAK					
M OF SCOTLAND OR CEILIDH AT THE GHILLIE DHU					
BREAK					
FORUM 12: ACC	FORUM 14: DD	FORUM 18: FCV	FORUM 21: CON	FORUM 26: PM	FORUM 30: VEN
FORUM 12: ACC	FORUM 14: DD	FORUM 18: FCV	FORUM 21: CON	FORUM 26: PM	FORUM 30: VEN
BREAK					
FORUM 12: ACC	FORUM 14: DD	FORUM 19: TC	FORUM 21: CON	FORUM 27: HAQ	FORUM 31: WCW
FORUM 12: ACC	FORUM 14: DD	FORUM 24: TR	FORUM 21: CON	FORUM 27: HAQ	FORUM 31: WCW
BREAK					

ERENCE CLOSE

17	CS	Culture & Society	24	TR	Transport
18	FCV	Future City Visions	25	RAA	Resilience, Aging & Adapting to Change
19	TC	Transition Communities	26	PM	Place Making & Wellbeing
20	ET	Education & Training	27	HAQ	Health & Air Quality
21	CON	Construction	28/29	MAT/CA	Materials/ Carbon Accounting
22	WW	Water & Waste	30	VEN	Ventilation
23	SND	Sound	31	WCW	Windcatchers & Windows

For details of each session, see the forum listings on the following pages.

PLEA 2017: FORUM LISTING

FORUM 1: PASSIVE & CLIMATIC DESIGN (PCD)

Chair: Colin Porteous, Glasgow School of Art

The wording of this dual topic is only a slight variant on the core brand of PLEA – Passive Low Energy Architecture. It indicates both the paramount importance of the design of the building itself, rather than any active servicing systems it may also require, as well as environmental interactions in its climatic context. What remains implicit is firstly that such an approach leads to little energy use with minimum carbon emissions, and secondly that it promotes occupiers' wellbeing in a holistic sense. This is not a new concept, PLEA itself running annual conferences since the early 1980s. But solutions have incrementally changed and refined over four decades even though hybrid 'passive-active' designs were already in the frame at that time in the hope of addressing key shortcomings in each approach. Then in the 1990s the German PassivHaus standard emerged, with basic tenets of insulation, good envelope design, air-tightness and a dependency on mechanical ventilation with heat recovery (MVHR). This approach was followed in the 2000s by the Active House approach with greater sustainability emphasis on adaptive comfort, renewable energy use, natural ventilation, lighting and energy storage. Over the last few years many modern buildings have been shown to perform less well than traditional construction types in, for instance in hot weather or in high winds, driving concerns over trends in overheating and construction failures experienced in many modern buildings. This then is the context for this forum, which it is hoped will raise questions of where next in the search for more resilient design, yield fresh experiences and provide a platform for deliberations on these important evolving issues, ideas and design solutions.

VENUE: Music Hall, Assembly Rooms

TIME: Tuesday 4th July Session A: 10.00 - 12.00

Session B: 12.30 - 14.30

Session C: 15.00 - 17.00

Wednesday 5th July Session A: 10.00 - 12.00

Session B: 12.30 - 14.30

FORUM 2: COMFORT & DELIGHT (CD)

Chair: Fergus Nicol, Oxford Brookes University

A key measure of the success of a building is whether people find it comfortable. Comfort is often achieved by installing lots of expensive equipment and spending lots on running it so the building can provide an acceptable temperature. Another approach is for the designers to take responsibility for understanding the heat flows through the building. With sensible design the building will allow the inhabitants to control the building to their own needs and desires: for instance maximising the benefits of heat gain from the sun; moving it through and storing it in the structure so as to avoid the danger of over-heating; using airflow through the structure to provide the rooms with good ventilation and using passive techniques to promote and enable occupant comfort. Truly Passive and Low Energy Architecture requires the designer to understand not just the building but also the inhabitants. Not just how they feel about the building but also how they react towards it and use it, and its environmental systems, to avoid discomfort. An understanding is needed of their physics and physiology, but also of the way they respond to the building they inhabit and interact with it. So papers on 'comfortable buildings' have been invited to highlight how good passive design can enhance comfort but also how designers can help inhabitants to achieve it. Papers also aim to help designers to understand human motivation and response to buildings: how providing ways to achieve comfort is the key and provides a fundamental insight into how we can continue to provide acceptable indoor climates in a warming world.

VENUE: West Drawing Room, Assembly Rooms

TIME: Tuesday 4th July Session A: 10.00 - 12.00

Session B: 12.30 - 14.30

Session C: 15.00 - 17.00

PLEA 2017: FORUM LISTING

FORUM 3: RENEWABLES / SOLAR BUILDINGS (RSB)

Chair: Tariq Muneer, Napier University

Renewables

The extraordinary growth of the renewables sector is nowhere better exemplified than in Scotland where the equivalent of around 60% of all energy consumed in the country is generated renewably. This Forum includes papers dealing with the application of the whole range of renewable energy technologies to the direct supply of building energy systems. Other aspects might be discussed such as, wind, water and ground source heat pump systems, and the integration of renewably generated energy into larger buildings.

Solar Buildings

Micro-generation of energy from solar sources have boomed in the early 2010's, incentivised mainly by generous Feed-In-Tariffs (FIT). In recent years, domestic scale energy storage to take full economic advantage of domestic solar has become a necessity due to the substantial cuts in FIT. The benefits, to the user for sustainable and independent energy generation in terms of economics and security of supply are becoming increasingly important. Challenges in terms of affordability (new build vs retro-fit), and efficient energy management within individual domestic dwellings and community schemes remain. A vision for the future and the contribution solar and hydrogen building can make will be the subject of this session. Papers have been invited on innovative solar PV, solar thermal, hydrogen and other storage technologies, as well as the integration of complementary technologies, economic financial and policy.

VENUE: West Drawing Room, Assembly Rooms

TIME: Wednesday 5th July Session A: 10.00 - 12.30

FORUM 4: COMMUNITY ENERGY (CE)

Chair: Andrew Peacock, Heriot Watt University

An energy revolution is happening in Scotland and around the world. In 2016 over 60% of energy consumed in Scotland came from renewable generation, from wind, solar, biomass, tidal, hydrogen and methane sources, and a growing proportion from local generation systems. Scotland now has many community energy projects and more on the books each year, encouraged by clear and effective government policy support and implementation, an effective NGO sector and grass roots level interest and investment in local energy generation (<http://www.communityenergyscotland.org.uk/>). Across Europe and the developed and developing world significant research has gone into optimising the value to local communities of such energy systems through orchestration of demand and supply, improved local weather forecasting, building and community level storage systems and consumption reduction strategies. Integrated research here includes inputs from social scientists, designers, lawyers, physicists, designers, engineers, economists and a surprising range of skills underpinning the extraordinary rise both here and internationally, of community energy schemes. Papers will share the experiences from a number of community schemes and the role of buildings within them, particularly where they identify how extra value can be extracted from the generated energy and / or deal with how barriers to their introduction have been overcome.

VENUE: West Drawing Room, Assembly Rooms

TIME: Wednesday 5th July Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 5: OVERHEATING (OH)

Chair: Samuel Domínguez-Amarillo. University of Seville

With the steep rise in global temperatures, overheating is one of the most visible effects of climate change on buildings. Further to forecasts more frequent extreme weather events and longer and warmer summers, the risk of overheating may well become one of the primary causes of building system failure. A major share of the energy presently consumed in buildings is used to expel heat, traditionally in warm regions, but increasingly in cold climates as well. Increasing internal loads, poor climatic design, over-glazed façades, over-engineered insulation, over-reliance on mechanical cooling and lack of natural ventilation all contribute to overheating that can affect comfort and productivity, lead to health problems, reduce in life expectancy and increase risk of death in the most vulnerable occupants. These issues, with possible rises in energy consumption, costs and greenhouse gas emissions and their impact on power generation and distribution systems (particularly electricity grids) make overheating an increasingly critical public problem. This forum aims to openly discuss definitions of, and explore cost efficient amelioration strategies for building designers, focusing in particular on existing buildings and the action that can be taken to improve their response to overheating through effective retrofitting design and operations that do not worsen the problem. Although many strategies are simple in theory (natural ventilation, shading, using vegetation etc.) many are much harder to achieve in real practice without compromising other factors such as noise control, safety, air quality or operating costs. The forum complements others dealing with lessons from vernacular solutions, new materials approaches, adaptive comfort design dilemmas such as the compromise between over-insulating and overheating risks, balancing passive and active measures and mechanical and behavioural control solutions.

VENUE: East Drawing Room, Assembly Rooms

TIME: Wednesday 5th July Session B: 12.30 - 14.30

FORUM 6: ENERGY EFFICIENCY (EE)

Chairs: David Jenkins and Fan Wang, Heriot Watt University

Regardless of whatever the future energy generation mix is that might best serve our energy demand it is vital that, across a multitude of sectors, we find a way of using less energy. Energy efficiency provides energy services at a lower operating cost, can be linked with healthier, better-functioning buildings, allows more flexibility in the way energy supply can meet energy demand, and, in doing so, helps countries to meet challenging carbon targets. Without prioritising energy efficiency, other approaches to carbon reduction are unlikely to be effective.

The International Energy Agency has estimated that approximately 50% of required climate mitigation will need to come from energy efficiency improvements. The United Nations Foundation, through initiatives such as the Global Energy Efficiency Accelerator Platform, is aiming to scale up the potential savings from energy efficiency and bring in improved technical support and funding. Within this landscape, the role of buildings is of huge importance. What should we now expect an energy efficient building to be? What technologies and designs should be encouraged? How will such buildings be used? How much can, and has, been achieved with energy efficiency programmes and what constitutes Best Practice in the field? We hope this Forum will help answer some of the questions.

VENUE: East Drawing Room, Assembly Rooms

TIME: Tuesday 4th July Session A: 10.00 - 12.00
Session B: 12.30 - 14.30

PLEA 2017: FORUM LISTING

FORUM 7: LIGHT (LIT)

Chair: Luisa Brotas, Network for Comfort and Energy Use in Buildings

A well-lit environment has innumerable advantages to both the occupants and owners of buildings and has huge implications for their actual sustainability and environmental impacts. The use of natural daylight and energy efficiency that lead to reductions in carbon emissions are at the forefront of sustainable design. Both good day and artificial lighting can play a major role promoting visual comfort, wellbeing and increasing productivity and integrated approaches to their complementary use can significantly reduce energy use in buildings. Principles of light are not new but recent technological developments of lamps and luminaires, controls and redirecting systems are creating good synergies and should be given much thought for early stages on an integrated design. Likewise new thinking, tools and criteria to design and assess artificial light, daylight and glare, allows quantification of their benefits on several spheres including energy savings, regulating our circadian system and promotion health. There is currently an active debate on the future of 'fit for purpose' regulations and guidelines associated with new approaches to the lighting of buildings. This forum is the place to discuss such important topics.

VENUE: East Drawing Room, Assembly Rooms

TIME: Tuesday 4th July Session C: 15.00 - 17.00

Wednesday 5th July Session A: 10.00 - 12.00

FORUM 8: BUILDING PERFORMANCE EVALUATION (BPE)

Chair: Tim Sharpe, Glasgow School of Art

For the last two decades in Britain there has been a growing awareness of the importance of Building Performance Evaluation (BPE) in achieving and maintaining energy use and emissions reductions in practice. Not only is BPE used in the day to day fine tuning of buildings in use to improve energy efficiency and occupant satisfaction with buildings but the lessons learnt from BPE have helped to improve design standards as architects and engineers use it to learn what works in buildings and what does not. BPE covers all stages of a project from concept and design to construction and post occupancy evaluation (POE) and both can be carried out in new, existing and refurbished domestic and non-domestic buildings. BPEs can cover fabric, building services and controls, energy, fuel and water use, handover and commissioning processes and occupant satisfaction and comfort. Papers will touch on many of these issues along with case studies of BPEs in practice and discussions of the potentials for BPEs in current and future markets.

VENUE: Wolfson Lecture Theatre,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00

Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 9: GREEN INFRASTRUCTURE (GI)

Chair: Kate Carter, University of Edinburgh

The developing ideas around the notion of 'Green Infrastructure' provide evolving ecological blueprints for natural frameworks and services designed to improve the social, economic and environmental health in buildings, settlements and regions. Green networks within and between urban, rural and aqueous landscapes can contain many different opportunities for tackling urban and climatic challenges by building with nature. The main components of such networks have been traditionally included storm water management, climate adaptation, heat stress reduction strategies, more biodiversity, food production, better air quality, sustainable energy production, clean water and healthy soils, as well as the more anthropocentric functions such as increased quality of life through recreation and provision of shade and shelter in and around towns and cities. Developing ideas around such green-infrastructures are now providing exciting new policy tools and approaches with which to re-plan landscapes and ecosystems to reduce their environmental stresses while at the same time enhancing social, economic and cultural value within them. Papers will look at different aspects of Green-infrastructural developments, case studies and ways and means of measuring their success in practice.

VENUE: Wolfson Lecture Theatre,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session C: 15.00 - 17.00

FORUM 10: BRIDGING THE PERFORMANCE GAP (BTG)

Chair: Paul Touhy, University of Strathclyde

Passive Low Energy Architecture success must be measured on actual energy and IEQ performance. There is much evidence that intended performance is not achieved in reality due to issues of design, construction, commissioning, or operation. This Forum aims to explore: design process and success criteria, the state of the art in understanding and addressing performance gaps, the extent to which current Industry and regulatory initiatives and processes do or do not address this issue, and what needs to be done in future. The extent to which processes such as Regulations, NABERS, BIM, LEED, Passivhaus, BREEAM, HQE, CASBEE, Energystar, Softlandings etc. really do (or in reality do not) address energy and IEQ performance gaps and deliver Passive Low Energy Architecture in practice is of interest. The extent to which design process is robust against variations likely to be seen in operations, behaviour and weather and how these variations are incorporated in measurements of performance is of interest. How limits to building performance range are expressed is of interest.

VENUE: Wolfson Lecture Theatre,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00
Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 11: COOL CITIES AND URBAN HEAT ISLANDS (UHI)

Chair: Rohinton Emmanuel, Glasgow Caledonian University

The twin realities of modern climate change and the rapid global urbanisation mean that most people will experience the effects of climate change in cities. In the face of increasing domestic and international political difficulties in reaching global agreements on mitigating/adapting to climate change, the need for local actions, especially those that ameliorate the negative climatic consequences of rapid urbanisation is beginning to be recognized, even by the Conference of Parties (CoP) to the UN Framework Convention on Climate Change (UNFCCC). This is in part due to the increasing realisation that mitigating the urban climate change is not only technically feasible but also politically achievable for state as well as city governments. Given the fact that cities are already engaged in adaptive actions many see cities as the 'first responders' to climate change and are already beginning to engage them. This Forum will explore the many ideas and exemplar practices in cool cities (including urban form manipulation, shade and ventilation enhancement, increased albedo etc). It will pay specific attention to the widely beneficial strategy of green infrastructure enhancement in different urban contexts and explore the environmental opportunities as well as economic and institutional barriers to their wide adoption.

VENUE: Wellcome Room East,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00
 Session B: 12.30 - 14.30
 Session C: 15.00 - 17.00

FORUM 12: ADAPTING TO CLIMATE CHANGE (ACC)

Chair: Rajat Gupta, Oxford Brookes University

Unprecedented rises in global temperatures have begun to have a huge range of impacts of varying severity. In the front line of the ensuing system failures are buildings, be they those that burn or flood blow away. These are the immediately visible impacts of the changing climate but underlying them are less obvious system failures like the overheating of buildings, breakdown of communities, the rising costs of keeping cool or warm and the growing inability of sections of the population to afford the necessary energy to do so. Much recent work has focussed on measuring change and its impacts and providing tools and resources to deal with it. The idea of 'Bouncing Forwards' to a better safer future is key and that will take much research and innovative thinking to make that happen. We hope much of that new thinking on how we can 'climate-proof' our citizens, buildings, cities and regions will be covered by papers in this Forum.

VENUE: Wellcome Room East,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00
 Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 13: HISTORIC AND VERNACULAR BUILDINGS (HVB)

Vernacular Buildings: Chair: Isaac Meir, Heriot Watt University

Vernacular buildings are a receptacle for local knowledge and skill in how to construct shelters and lifestyles that enable populations to live comfortable, and or safely, in even the most extreme climates. This wisdom resulted in the building blueprints for survival in the pre-machine age, but these design skills are all too often being lost in the proliferation of new construction techniques, materials, mantras and technologies. In a future of more extreme climate events, of growing populations of diminishing resources and lower income expectations the actual essential building will again become key as we learn to do 'more with less' and we will need to revisit those old wisdom and understanding of good local climatic design that is enshrined in the regional vernacular archetypes. The evolution of a 21st century vernacular that is fit for purpose in a rapidly changing world has to be a two way process where the use of modern methods and understanding can help us to improve those archetypes and in turn create safer building and settlements in the climates, societies and economies of the future. Papers will not only shed light of the skills and wisdom of the traditional vernacular builder but also on the lessons we can draw from them to lay the foundations for a better future for the species and societies of our planet.

Historic Buildings and Refurbishment: Chairs: Amar Bennadji, Robert Gordon University / Roger Curtis, Historic Environment Scotland

The majority of the buildings that will exist in 2050 are already built. The greatest challenge we face today is to ensure that these buildings are brought up to a standard that can not only ensure they continue to provide safety and comfort of their occupants over time but also that the energy used to do so does not have too great an impact on our climate and environment. The challenge of bringing older buildings up to modern day performance standards can be a daunting one but where better to discuss the challenges involved than in Scotland where historic and existing buildings have been adapted, improved and built on for centuries. Papers here will show how much progress has been achieved in the historic buildings sector through investment and research in Scotland. Papers in this forum will look at policies and programmes for building improvement, case studies of how value at many levels can be extracted from refurbishment exemplars and also at research designed to provide robust and durable fabric and technological solutions for the reinforcement and improvement of older buildings.

VENUE: Wellcome Room West,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00
 Session B: 12.30 - 14.30
 Session C: 15.00 - 17.00

FORUM 14: DIGITAL DESIGN (DD)

Digital Design - Chair: Joe Clarke, University of Strathclyde

Building performance simulation provides an unsurpassed means to test the robustness of proposed design solutions under realistic operating conditions and in terms of the many conflicting cost and performance attributes that need to be kept in balance. That said the approach will necessarily correspond to an ideal state with respect to system operation, including occupant interactions. Performance in practice may therefore be different from the design intent, a gap that can be addressed by routine conditions monitoring supporting remedial action informed by timely feedback. Many of the forum's papers deal also with the difficult challenges of getting building simulations to be as accurate and useful for design and problem solving as possible. This conference theme will include presentations addressing developments in the application of building performance simulation at the design and operational stages with particular emphasis on approaches that connect the two phases and thereby help to bridge the performance gap.

VENUE: Wellcome Room West,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00
 Session B: 12.30 - 14.30

PLEA 2017: FORUM LISTING

FORUM 15: AESTHETICS AND DESIGN (AD)

Chair: Ola Uduku, University of Edinburgh

Frank Lloyd Wright's Solar Hemicycle House designed for Herbert and Katherine Jacobs in Wisconsin in 1946 was a radical departure from the architecture of the time with its semi-circular layout and use of low embodied energy materials to conserve heat. The introduction of energy efficiency legislation in the early 1990's, has resulted in unprecedented growth in architectural solutions, new building forms and aesthetic approaches to low energy building design. This has been in part due to the development and understanding of economic methods for designing and delivering low energy buildings, coupled to new passive and active technologies for conserving and generating energy. With this new understanding, low-energy building design is now not just the result of applying one or more isolated technologies. The achievement of this energy goal when successful is often accompanied by design choices that significantly influence architectural form. The aim of achieving low energy consumption, usually combining energy efficiency measures, mechanical systems and /or intelligent controls affects both the way in which the envelope as well as its contents are conceived, establishes a strong connection between the form of energy and the form of the architecture. Quite often successful design is a result of an integrated whole-building process that requires action and integration on the part of the design team throughout the entire project development process. How these concepts are radically shifting our perceptions and approaches to our built environment from the scale of individual buildings to new design and aesthetic approaches to neighbourhoods, districts and entire cities is of interest.

VENUE: Lower Gallery,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00
 Session B: 12.30 - 13.30

FORUM 16: LOW CARBON DESIGN (LCD)

Chair: Gokay Deveci, Robert Gordon University

The European Directive on the energy performance of buildings was designed to improve the energy efficiency of buildings and reduce carbon emissions from them and the impact of buildings on climate change. The Recast directive 2010/31/EU was adopted on 19 May and it's Article 9 requires that member states ensure all new buildings are nearly zero-energy buildings (nZEB) by 31st December 2020 and that after the 31st December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings. The directive required that member states draw up national plans for increasing the number of nearly zero-energy buildings and develop policies and take measures to stimulate the transformation of buildings that are refurbished into nearly zero-energy building. These are extraordinarily ambitious targets and many member states are finding it difficult to step up to this policy plate and Britain – voting for Brexit – no longer has to pretend to. Around the world the idea of low / zero / near zero-carbon buildings are gaining traction as a low hanging fruit for climate mitigation policies, and this Forum will look at buildings from around the world that have attempted to reach these aspirational standards, with their design rationales, records of their performance in practice and discussions, backed up by analyses, of the ways forward for Low Carbon Buildings in current building and economic markets. Can we make them happen in reality?

VENUE: Lower Gallery,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session B: 13.30 - 14.30
 Session C: 15.00 - 17.00

PLEA 2017: FORUM LISTING

FORUM 17: CULTURE AND SOCIETY (CS)

Chair: Andrew Toland, University of Technology, Sydney

For at least several decades now, environmental issues and aspirations have increasingly become woven into the fabric of daily life. At the same time, many would argue that we have yet to experience the kind of 'cultural shift' necessary to transform lifestyles and consumption patterns in ways that might have a significant impact on carbon emissions, resource depletion or declines in biodiversity. These are no longer just issues in developed western societies, but are also being debated in developing and non-western contexts, and considered in relation to different cultural conceptions of the relationship between society and 'nature'. In addition, a longstanding intra-disciplinary rift between, on the one hand, the 'art' of architecture as a carrier of cultural, social and intellectual meaning, and, on the other, 'sustainable' architecture as an opportunity to contribute to environmental progress, demands to be reconciled if the discipline is to move forward at a moment when environmental issues are increasingly material and cultural at one and the same time. Because architecture and design are key conduits for translating 'culture' into material realities and giving form to collective social ambitions, an explicit consideration of cultural and social formations and their connection to the arena of sustainable architecture seems more urgent than ever. The purchase of the notion of the Anthropocene on the contemporary artistic (including architectural) imagination is just one example of how environmental issues are now crucially shaping cultural production. Similarly, tacit cultural positions are equally at work in what appear to be purely technical manifestations of sustainable architecture. These interrelationships between social and cultural practices and the sustainable creation and use of the built environment demand investigation and may contribute to our understanding of the kinds of 'ecological' transformation that might be possible in a given society at a given time. Papers will reflect on these issues across a variety of cultural and social contexts (or even within earlier historical settings) to develop an understanding of, and dialogue about, the interaction between culture, society, environmental and attitudinal change, and architecture's potential in shaping and channelling these dynamics.

VENUE: Swann Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session C: 15.00 - 17.00

FORUM 18: FUTURE CITY VISIONS (FCV)

Chair: Circe Monteiro, Federal University of Pernambuco, Recife

There will be two main aspects of this forum: the idea of 'joined-up policy making' set against clear ideas of future visions for a city and then a second plenary session on 'water safe cities'. For the first the extraordinary achievements of the City State of Singapore will be drawn on at the plenary session with speakers contributing not only programmes and progress associated with individual professional field but also elucidating the 'Joined-up Visioning' that has helped the state develop a prioritised, and actioned plan to incrementally steer the State towards an ultimately sustainable future. The scope of that vision is extraordinary and includes plans to reduce the temperature across the island over degrees to help cope with the rising temperatures in a warming world and create climate proof energy, transport and economic infra-structures. The water safe cities plenary will set out how four leading global cities have responded to events, research and climate projections to take major alterations to how their own cities are planned, built and operated in response to flooding and water quality challenges, all set within an evolving long term visioning process designed to build resilience into their physical, economic and social urban structures and futures.

VENUE: Lower Gallery,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00

PLEA 2017: FORUM LISTING

FORUM 19: TRANSITION COMMUNITIES (TC)

Chair: Keith Baker, Glasgow Caledonian University

The communities we live in today are the foundations of the societies future generations will inhabit, and the buildings we design today will be a very visible and tangible legacy. Papers in this Forum will address how low energy architecture and built environments can help bring about transitions towards lower carbon and more resilient communities, and similarly how empowered low carbon communities can influence the growth of low energy architecture and the reduction of emissions from built environments. They will also address how communities can influence, or be influenced by, other aspects of healthy buildings and built environments, such as improving levels of thermal comfort and affordable warmth, and tackling energy and fuel poverty. Both quantitative and qualitative studies are included and where quantitative studies are presented these will emphasise the use of measured, rather than modelled data. Papers will have a strong policy focus, locally, nationally or internationally, and address relevant legislation and standards, and multi-disciplinary approaches.

VENUE: Lower Gallery,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session B: 12.30 - 13.50

FORUM 20: EDUCATION AND TRAINING (ET)

Chair: Ashraf Salama, Head of Architecture, University of Strathclyde

No other professions have undergone as dramatic a transformation in the past decades as that of the design and construction professions. In local, regional, and global contexts, education for the creative and construction industries continually encounters demands to assimilate increasingly rapid changes in building markets into the courses and enable their more effective integration into practice. Education in architecture and urbanism provides the fundamental foundations for the aspiration of "designing to thrive", by facilitating the transfer of knowledge and skills from the market requirements into the design professions to help them to continue to meet the wishes and needs of their society, economy and environment. This requires constant updating of our educational systems, and in recent decades the way in which design education and training are provided, and their consequences and impacts, have been treated as a research field on their own. Awareness has grown of the need to keep education's underpinning theories, contents and contexts, methods and tools continuously questioned and diagnostically examined to ensure they are fit for purpose in the 21st century, genuinely addressing contemporary environmental and societal challenges and taking advantages of emerging opportunities as they arise. Papers are aimed at broadening and deepening the debate on how well the education and training of design professionals are contributing to shaping a Thriving Future.

Selected papers will be featured in a special PLEA 2017 Issue of the highly ranked, open access journal "Archnet-IJAR: International Journal of Architectural Research".

VENUE: Scott Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00
Session B: 12.30 - 14.30
Session C: 15.00 - 17.00

PLEA 2017: FORUM LISTING

FORUM 21: CONSTRUCTION (CON)

Chair: Phil Banfill, Heriot Watt University

Low energy architecture requires both appropriate materials and construction technologies that can be built in practice. Papers will look at the properties and performance of low-energy materials, on appropriate construction assemblies for low-energy buildings, and on any aspects of construction that are not dealt with in other themes, including, but not limited to, structure, fabric, heat transfer, lighting, sound attenuation, moisture transport, airtightness, environmental impact, life cycle assessment and costs. They may report research outcomes or case studies of buildings/designs.

VENUE: Scott Room,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00
Session B: 12.30 - 14.30

FORUM 22: WATER AND WASTE (WW)

Chair: David Kelly, Heriot Watt University

Water has a very important, if not crucial, role in the way we live our lives. We depend on a clean and safe water supply to meet our daily needs: we use it for drinking and bathing, for growing food and producing resources, for creating beautiful urban vistas, and also for providing fun and recreation. Our modern world is built on the foundations of reliable sanitation and drainage systems for carrying wastewater and rainwater. Yet, the management of these vital water systems are facing significant challenges globally due to rising populations, urban densification, and climate change impacts. The growing frequency of water shortages, flooding, and watercourse pollution are all signs that our existing infrastructure is stressed and unable to cope. New ways of managing water in our cities, towns, and villages is needed that not only sustains a healthy natural environment whilst meeting human needs, but that also harmoniously integrates water cycle management with our built environment. For this to happen, we need sustained inter-disciplinary and cross-sector collaboration, as well as actors for the mobilisation of social change. Papers will touch on issues of efficiency, innovative thinking and products and new approaches to solving water and waste problems.

VENUE: James Clerk Maxwell Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 11.00

FORUM 23: SOUND (SND)

Chair: Laurent Galbrun, Heriot Watt University

Studies have shown that engineering noise control solutions are not sufficient for dealing with today's acoustical challenges, as multiple factors affect sound and its perception. Within that context, it is now accepted that acoustic design can greatly benefit from perceptual approaches that complement traditional engineering solutions, for example using positive sounds (e.g. water, birdsongs, bells and wind in trees) to mask noise. This is in line with the broader soundscape approach, which relies on both physical characteristics and mental perception of the aural environment. Soundscape research is multidisciplinary by nature, as it combines engineering and social science methodologies, in view of developing qualitative solutions aimed at improving quality of life and comfort. Papers will look at a number of innovative acoustic solutions and acoustic research.

VENUE: James Clerk Maxwell Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 11.00 - 12.00

PLEA 2017: FORUM LISTING

FORUM 24: TRANSPORT (TR)

Chair: Harald N. Røstvik, University of Stavanger

In our rapidly changing world transport is the glue that connects the many different aspects of our lifestyles and the buildings and settlements they occur in. Some see transport in terms of the logistics of getting from A to B, with more traffic on congested and underfunded road and rail systems, or opportunities to rationalise, innovate and profit from new transport solutions. Other may associate their transport habits with commuter frustrations, poor air quality and road safety and issues noise and stress. As the percentage of populations who move to, and live in cities grows, transport issues increasingly determine how successful a building, city and region is, not only in terms of its productive output, efficiency and operational costs and impacts but also the quality of life and well-being of the citizens who occupy them. Papers will cover different aspects of this subject and will relate to the ways in which transport can impact on the energy consumption and/or quality of life of citizens in their daily lives and the buildings and settlements they occupy.

VENUE: Lower Gallery,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session B: 13.50 - 14.30

FORUM 25: RESILIENCE, AGEING & ADAPTING TO CHANGE (RAA)

Co-Chairs: Bev James (Director, Public Policy & Research) and Kay Saville-Smith, (Director at CRESA, Centre for Research, Evaluation and Social Assessment), New Zealand

Architecture and urban design are pivotal factors in the challenge of aging well. Population ageing is inevitable and irrefutable. The resilience, sustainability and functionality of our dwellings and the built environment are key to realising the benefits of the longevity dividend, of living well, as well as long. Homes in particular not only reflect the social and economic conditions of their occupants, but can also dictate them. They ideally, can meet the everyday needs and preferences of older citizens and their lifestyles, and additionally provide crucial protection against extreme events and other hazards. Many societies promote 'ageing in place', 'lifetime homes' and 'age-friendly cities' that support older people to continue to age in their homes and communities, remain independent for as long as possible and reduce reliance on institutional aged care. But how are those policies played out in practice? Do they have the outcomes sought and expected? How do such policies actually relate to growing trends towards less home ownership and greater renting among older people? How should next step policies cope with emerging demographic and occupancy trends? How can quality of life for older people be maintained in shifting social and economic landscapes? These are major questions for our age.

VENUE: James Clerk Maxwell Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session B: 12.30 - 14.30
Session C: 15.00 - 17.00



PLEA 2017: FORUM LISTING

FORUM 26: PLACE MAKING AND WELLBEING (PM)

Chair: Suzanne Ewing, University of Edinburgh

The key theme of PLEA 2017 is 'Design to Thrive' and increasingly success in planning, architecture and urban developments is seen in terms of the extent to which developments enhance the lives of those who live, utilise and work in them. The term 'wellbeing' is often used to describe and explore ideas of how one measures and manages that enhancement. As we move away from the idea that a flourishing life is primarily connected to material prosperity towards one that positions wellbeing as a significant goal for public policy, this shift is being accompanied by a commitment to empower local communities, unlocking social capital and giving individuals greater voice in the processes of place making that determine the quality and direction of their lives. Together, these changes provide opportunities to secure healthier life styles, safeguard ecological-integrity, promote greater equity and support more resilient places in the low carbon future. Ideas of well-being and place-making offer a people-centred approach to design that can have cost-free impacts in terms of significantly improving the quality of life of people and the communities they live in. Papers will look at aspects of the above and in particular issues around how one measures and manages levels of well-being and success in place-making exercises.

VENUE: James Clerk Maxwell Room,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00

FORUM 27: HEALTH AND AIR QUALITY (HAQ)

Chair: Grainne McGill, Glasgow School of Art

Both indoor and outdoor air quality have a fundamental influence on the health, wellbeing and comfort of building occupants. The air we breathe can contain more than 900 different chemicals, biological material, and particles, many of which may be potentially harmful to human health. In developed countries, people spend on average 90% of their time indoors and so architects and built environment professionals have a profound responsibility for creating a healthy indoor environment. Whilst awareness of the impacts of climate change has prompted significant changes in construction practice, there are now emerging concerns that mitigation strategies may have unintended consequences, particularly on the quality of indoor air. Yet knowledge and understanding of indoor air quality principles and policies among designers remain critically lacking. How do we ensure decarbonisation of buildings whilst ensuring a healthy and comfortable indoor environment? Papers will focus on the ways that the design, construction, management, operation and maintenance of passive and low energy buildings can impact on the quality of indoor air (both perceived and measured) and the health of building occupants.

VENUE: James Clerk Maxwell Room,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 28+29: MATERIALS (MAT) / CARBON ACCOUNTING (CA)

Co-Chairs: Sam Chapman, Heriot Watt University/ Francesco Pomponi, Napier University

Materials

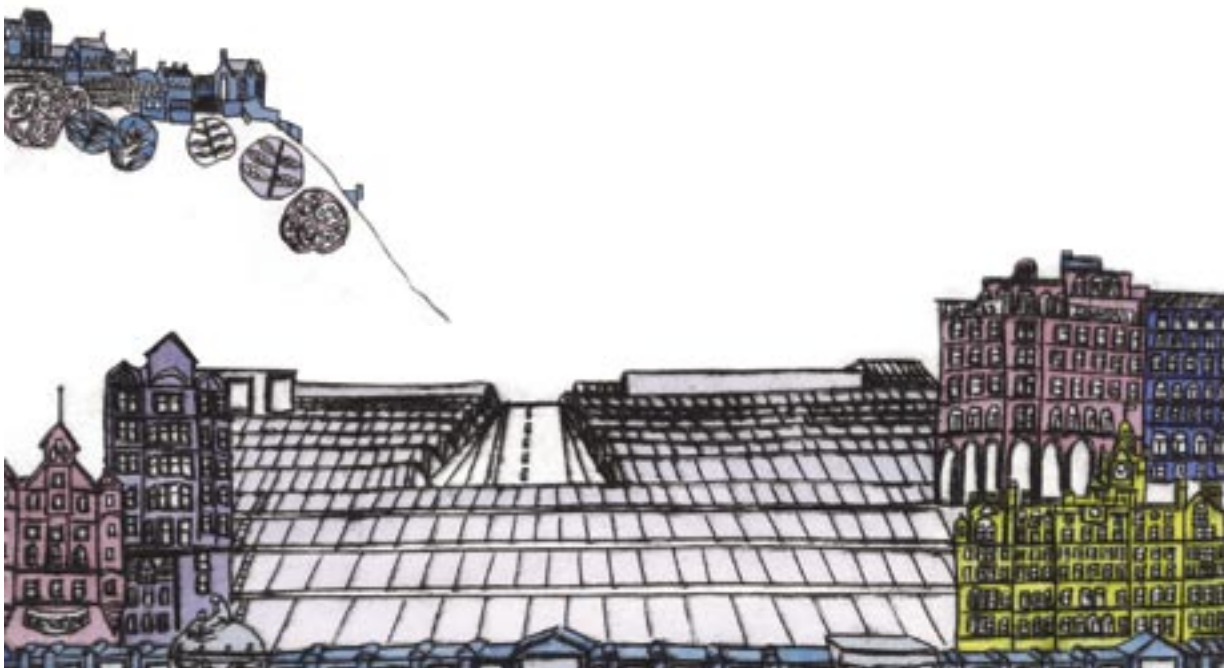
Construction practises and the production of building materials have some of the largest impacts on society on the planet. These range from the environmental impacts of raw material extraction and refinement to the multi-faceted effects materials can have on the well-being of occupants interacting with buildings themselves. However slow the construction industry has traditionally been to innovate to reduce such impacts compared with other industries, there is now a momentum for change that reflects the urgency of the need to develop more sustainable building materials and practises to house growing populations while at the same time drastically reducing the impacts of doing so. New materials innovations are key to achieving these environmental and social aspirations at an acceptable cost in terms both of energy and carbon emissions of production, construction and end of life demolition as well as their human impacts on building occupants. The construction industry has an opportunity to lay the foundations for a truly circular economy, with huge knock on benefits in reducing shortages in material supply, meeting the looming regulatory requirements for construction waste reduction by 2025 and also increasing recycling within the industry. Papers covering research on the development and application of new materials, the modification of existing materials or the novel use of recycled building wastes in the material production stream are invited. The PLEA 2017 Materials Forum provides a platform to share and exchange experiences, knowledge and ideas on the emerging landscape of innovative and appropriate materials development for both global and local construction industries.

Carbon Accounting

The bottom line of our survival as a species and a planet is best represented by the trends in carbon emissions from our societies around the world. As the ice melts globally and temperatures rise causing increasingly extreme climate events we understand how important the ratcheting down of emissions are to meet reasonable long term carbon targets for survival. But how often do we hear carbon seriously discussed now? It appears that the interest in carbon emission accounting prior to the 2008 global economic recession (www.icarb.org) has lost its impetus since then. But our global future on this planet depends on it. We are asking to interesting and challenging papers on this subject and will hold a forensic discursive plenary panel discussion on the subject here in Scotland, the first country in the world to publish both a financial and a carbon budget in parallel. How to make Carbon Matter Again? A question we want answered in this Forum.

VENUE: Swann Room,
Royal Society of Edinburgh

TIME: Tuesday 4th July Session A: 10.00 - 12.00
 Session B: 12.30 - 14.30



PLEA 2017: FORUM LISTING

FORUM 30: VENTILATION (VEN)

Chair: Brian Ford, Natural Cooling Ltd.

It is inevitable that we will have to do more work in future to maintain comfort in our buildings using less fossil fuel energy in our changing climate. In the 1990s an emphasis was placed on increasing the energy efficiency of mechanical systems to achieve emissions reductions but these produced often only small incremental improvements. After the turn of the century a modal shift to new mechanical solutions followed, such as the use of air, water and ground sourced heat pumps and heat recovery to reduce heat demand in buildings, produce it more efficiently and harvesting local energy at the same time. In recent years the shift has been to increasingly looking at ways to optimise the overwhelming benefits of using natural ventilation for as much of the year and day as possible to provide big step changes in reducing greenhouse gas emissions while at the same time providing adequate indoor air quality and local cooling. There are many exciting developments in this field in optimised mechanical solutions, through to mixed mode and fully naturally ventilated systems that couple with new thinking on ideas on the heating and cooling individuals within spaces. Inevitably a future goal is for the down-sizing of mechanical systems, compensated for by better designed, built and performing buildings and the use of more natural conditioning to create truly sustainable ventilation systems that are fit for purpose in a warming future. Papers will touch on the whole range of approaches to the effective ventilation of buildings, particularly in relation to how they are appropriate for passive and low energy buildings.

VENUE: Swann Room,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session A: 10.00 - 12.00

FORUM 31: WINDCATCHERS AND WINDOWS (WCW)

Chair: Sue Roaf, Heriot Watt University

Windcatchers are some of the most sophisticated natural air-conditioning systems in the world, and records of them adorning buildings date back to the Middle Kingdom in Egypt over 1000BC. In many hot countries they flourished most prominently on the homes of the richer classes when flowered in buoyant economies. Their great age has left marvellous traces in the great towers above settlement across Iran and the Gulf. Modern architects and engineers have long sought to emulate the visual and functional elegance of these traditional devices and as we enter and on increasing pressure to run buildings for as much of the year as possible on natural ventilation there are many intuitions working on the underlying mechanisms of their success as advanced natural systems.

Windows are so important to the success and impacts of building: their size, functions, operation, materials, appearance, proportions and colour. Yet they have been largely side-lined as dynamic building elements by many practising designers who are content to minimising costs, design originality, natural ventilation of interiors by simply 'glazing walls' or using the business as usual façade articulations in their 'modern buildings'. Increasingly the leading edge architects and engineers are working together to innovate new window approaches and seasonal and diurnal window opening protocols in the quest for genuinely low carbon building designs that can also minimise glare generated by the glass itself. Future facing comfort paradigms increasingly rely on the use of natural ventilation through windows and walls for as much of the day or year as possible. Our session will start with a discussion on the future of windows on our evolving building markets.

VENUE: Swann Room,
Royal Society of Edinburgh

TIME: Wednesday 5th July Session B: 12.30 - 14.30



MONDAY 3RD JULY

PLENARY SESSIONS 1 & 2: 13.30 - 18.00

PLENARY 1: WELCOME TO EDINBURGH

13.30 - 14.40 MUSIC HALL, ASSEMBLY ROOMS

- 13.30 - 13.40 **Conference opening**
Louise Batchelor, Conference Chair
- 13.40 - 13.50 **Welcome to our great City**
Frank Ross, RH Lord Lieutenant & Lord Provost of Edinburgh
- 13.50 - 14.00 **Edinburgh's landforms and climate**
Rab Bennetts, Bennetts Associates
- 14.00 - 14.10 **Why we value Scotland's buildings**
Fiona Hyslop, Member of the Scottish Parliament
- 14.10 - 14.20 **What Scotland has given the architecture of the world**
Neil Baxter, Royal Incorporation of Architects in Scotland
- 14.20 - 14.30 **Opportunities & challenges: Scotland's historic buildings**
David Mitchell, Historic Environment Scotland
- 14.30 - 14.40 **Welcome for the PLEA Family to PLEA 2017**
Edward Ng, Chinese University of Hong Kong, President of PLEA

14.40 - 15.20 BREAK

PLENARY 2: POSSIBLE FUTURES AND ESCALATING CHALLENGES

- 15.20 - 15.30 **Revolutions - A Wake Up Call**
Louise Batchelor, Conference Chair and Susan Roaf, Heriot Watt University
- 15.30 - 15.40 **Demographics: Ageing Well in Hard Times**
Kay Saville-Smith, CRESA NZ
- 15.40 - 15.50 **The impacts of War on Building Heritage**
Ihsan Fethy, Amman Ahliya University, Jordan
- 15.50 - 16.00 **Powering Buildings in Post Fukushima Japan**
Ken Ichi Kimura, Tokyo University

MONDAY 3RD JULY

PLENARY 2 CONT: ESCALATING CHANGES/ BIG REVOLUTIONS

16.00 - 16.10 **Climate-proofing buildings and cities**
Alex Wilson, Resilient Design Institute

16.10 - 16.20 **Barriers and opportunities for a solar future**
Karin Kappel, Solar Cities Denmark

BIG REVOLUTIONS

16.20 - 16.30 **Electric car revolution in Norway**
Harald N. Røstvik, University of Stavanger

16.30 - 16.40 **Digital resetting of mindmaps around buildings**
Joe Clark, University of Strathclyde

16.40 - 16.50 **Water-proofing cities - LA and New Orleans**
Matt Petersen Los Angeles City Council

16.50 - 17.00 **Identifying and meeting the Big Challenges**
Ellie Tonks, Climate Kic

17.00 - 17.05 BREAK

PLENARY 2 CONT: BUILDING SOLUTIONS

17.05 - 17.15 **Urban Comfort for Higher Density**
Matthias Schuler, Transsolar

17.15 - 17.55 **Garden City, Mega City – Strategies for the 21st Century Sustainable City**
Richard Hassell, WOHA

17.55 - 18.00 **First Day Wrap**
Louise Batchelor, Conference Chair

RECEPTION
Ballroom Assembly Rooms
18.00 - 20.00

TUESDAY 4TH JULY

PLENARY SESSION 3: 08.30 - 09.30

PLENARY 3: GOOD DESIGN

08.30 - 09.30 MUSIC HALL, ASSEMBLY ROOMS

08.30 - 08.50 **Adaptable buildings: designed to last**
Rab Bennetts, Bennetts Associates

08.50 - 09.10 **Added value in design**
Matthias Schuler, Transsolar

09.10 - 09.30 **Climate-proof buildings & cities: the challenge**
Matt Petersen, Los Angeles City Council

BREAK 09.30 - 10.00

FORUM SESSIONS COMMENCE 10.00



TUESDAY 4TH JULY

FORUM SESSIONS A: 10.00 - 12.00

ASSEMBLY ROOMS

FORUM 1: PASSIVE & CLIMATIC DESIGN

Music Hall: 10.00 - 12.00

Chair: Colin Porteous, Glasgow School of Art

FORUM 2: COMFORT AND DELIGHT

West Drawing Room: 10.00 - 12.00

Chair: Fergus Nicol, Oxford Brookes University

FORUM 6: ENERGY EFFICIENCY

East Drawing Room: 10.00 - 12.00

Co-Chairs: David Jenkins, Heriot Watt University/ Fan Wang, Heriot Watt University

ROYAL SOCIETY OF EDINBURGH

FORUM 8: BUILDING PERFORMANCE EVALUATION

Wolfson Lecture Theatre: 10.00 - 12.00

Chair: Tim Sharpe, Glasgow School of Art

FORUM 11: COOL CITIES & URBAN HEAT ISLANDS

Wellcome Room East: 10.00 - 12.00

Chair: Rohinton Emmanuel, Glasgow Caledonian University

FORUM 13: HISTORIC BUILDINGS / VERNACULAR BUILDINGS

Wellcome Room West: 10.00 - 12.00

Chair: Isaac Meir, Heriot Watt University

FORUM 15: AESTHETICS & DESIGN

Lower Gallery: 10.00 - 12.00

Chair: Ola Uduku, University of Edinburgh

FORUM 20: EDUCATION AND TRAINING

Scott Room: 10.00 - 12.00

Chair: Ashraf Salama, University of Strathclyde

FORUM 22: WATER AND WASTE

James Clerk Maxwell Room: 10.00 - 11.00

Chair: David Kelly, Heriot Watt University

FORUM 23: SOUND

James Clerk Maxwell Room: 11.00 - 12.00

Chair: Laurent Galbrun, Heriot Watt University

FORUM 28 + 29: MATERIALS / CARBON ACCOUNTING

Swann Room: 10.00 - 12.00

Co-Chairs: Sam Chapman, Heriot Watt University / Francesco Pomponi, Napier University

BREAK 12.00 - 12.30

FORUM SESSIONS B: 12.30 - 14.30

ASSEMBLY ROOMS

FORUM 1: PASSIVE & CLIMATIC DESIGN

Music Hall: 12.30 - 14.30

Chair: Colin Porteous, Glasgow School of Art

FORUM 2: COMFORT AND DELIGHT

West Drawing Room: 12.30 - 14.30

Chair: Fergus Nicol, Oxford Brookes University

FORUM 6: ENERGY EFFICIENCY

East Drawing Room: 12.30 - 14.30

Co-Chairs: David Jenkins, Heriot Watt University/ Fan Wang, Heriot Watt University

ROYAL SOCIETY OF EDINBURGH

FORUM 8: BUILDING PERFORMANCE EVALUATION

Wolfson Lecture Theatre: 12.30 - 14.30

Chair: Tim Sharpe, Glasgow School of Art

FORUM 11: COOL CITIES & URBAN HEAT ISLANDS

Wellcome Room East: 12.30 - 14.30

Chair: Rohinton Emmanuel, Glasgow Caledonian University

FORUM 13: HISTORIC BUILDINGS / VERNACULAR BUILDINGS

Wellcome Room West: 12.30 - 14.30

Co-Chairs: Amar Bennadji, Robert Gordon University /
Roger Curtis, Historic Environment Scotland

FORUM 15: AESTHETICS & DESIGN

Lower Gallery: 12.30 - 13.30

Chair: Ola Uduku, University of Edinburgh

FORUM 16: LOW CARBON DESIGN

Lower Gallery: 13.30 - 14.30

Chair: Gokay Deveci, Robert Gordon University

FORUM 20: EDUCATION AND TRAINING

Scott Room: 12.30 - 14.30

Chair: Ashraf Salama, University of Strathclyde

FORUM 25: RESILIENCE, AGING AND ADAPTING TO CHANGE

James Clerk Maxwell Room: 12.30 - 14.30

Co-Chairs: Bev James, Public Policy & Research, N.Z./ Kay Saville-Smith, CRESA, N.Z.

FORUM 28 + 29: MATERIALS / CARBON ACCOUNTING

Swann Room: 10.00 - 12.00

Co-Chairs: Sam Chapman, Heriot Watt University / Francesco Pomponi, Napier University

BREAK 14.30 - 15.00

FORUM SESSION C: 15.00 - 17.00

ASSEMBLY ROOMS

FORUM 1: PASSIVE & CLIMATIC DESIGN

Music Hall: 15.00 - 17.00

Chair: Colin Porteous, Glasgow School of Art

FORUM 2: COMFORT AND DELIGHT

West Drawing Room: 15.00 - 17.00

Chair: Fergus Nicol, Oxford Brookes University

FORUM 7: LIGHT

East Drawing Room: 15.00 - 17.00

Chair: Luisa Brotas, Network for Comfort & Energy Use in Buildings

ROYAL SOCIETY OF EDINBURGH

FORUM 9: GREEN INFRASTRUCTURE

Wolfson Lecture Theatre: 15.00 - 17.00

Chair: Kate Carter, University of Edinburgh

FORUM 11: COOL CITIES & URBAN HEAT ISLANDS

Wellcome Room East: 15.00 - 17.00

Chair: Rohinton Emmanuel, Glasgow Caledonian University

FORUM 13: HISTORIC BUILDINGS / VERNACULAR BUILDINGS

Wellcome Room West: 15.00 - 17.00

Co-Chairs: Amar Bennadji, Robert Gordon University /

Roger Curtis, Historic Environment Scotland

FORUM 16: LOW CARBON DESIGN

Lower Gallery: 15.00 - 17.00

Chair: Gokay Deveci, Robert Gordon University

FORUM 17: CULTURE AND SOCIETY

Swann Room: 15.00 - 17.00

Chair: Andrew Toland, University of Technology, Sydney, Australia

FORUM 20: EDUCATION AND TRAINING

Scott Room: 15.00 - 17.00

Chair: Ashraf Salama, University of Strathclyde

FORUM 25: RESILIENCE, AGING AND ADAPTING TO CHANGE

James Clerk Maxwell Room: 15.00 - 17.00

Co-Chairs: Bev James, Public Policy & Research, N.Z./ Kay Saville-Smith, CRESA, N.Z.

BREAK 17.00 - 17.15

TUESDAY 4TH JULY

PLENARY SESSION 4: 17.15 - 18.30

PLENARY 4: NEW DIRECTIONS

17.15 - 18.30 MUSIC HALL, ASSEMBLY ROOMS

- 17.15 - 17.35 **What is 'Good Design'**
Isabelle Toland, Aileen Sage, Sydney
- 17.35 - 17.55 **Rethinking regulation post Hurricane Sandy**
Alex Wilson, Resilient Design Institute
- 17.55 - 18.15 **Learning from Edinburgh Botanic John Hope Gateway**
Roddy Langmuir, Architect, Cullinan Studio
- 18.15 - 18.30 **25 Years Living with Nature**
Dean Hawkes, Velux

CONFERENCE DINNER

National Museum of Scotland, Chambers Street
19.30 - 23.00

CEILDH

Ghillie Dhu, Rutland Street
19.30 onwards

WEDNESDAY 5TH JULY

PLENARY SESSION 5: 08.30 - 09.30

PLENARY 5: RE-THINKING DESIGN

08.30 - 09.30: MUSIC HALL, ASSEMBLY ROOMS

- 08.30 - 08.50 **Low tech buildings**
Kris de Decker, Low Tech Magazine
- 08.50 - 09.10 **What makes a good building?**
Adrian Leaman, Useable Buildings Trust
- 09.10 - 09.30 **Why assess performance from the occupant's viewpoint?**
George Baird, Victoria University of Wellington

BREAK 09.30 - 10.00

FORUM SESSIONS COMMENCE 10.00



FORUM SESSION A: 10.00 - 12.00

ASSEMBLY ROOMS

FORUM 1: PASSIVE & CLIMATIC DESIGN

Music Hall: 10.00 - 12.00

Chair: Colin Porteous, Glasgow School of Art

FORUM 3: RENEWABLES / SOLAR BUILDINGS

West Drawing Room: 10.00 - 12.00

Chair: Tariq Muneer, Napier University

FORUM 7: LIGHT

East Drawing Room: 10.00 - 12.00

Chair: Luisa Brotas, Network for Comfort & Energy Use in Buildings

ROYAL SOCIETY OF EDINBURGH

FORUM 10: BRIDGING THE PERFORMANCE GAP

Wolfson Lecture Theatre: 10.00 - 12.00

Chair: Paul Touhy, University of Strathclyde

FORUM 12: ADAPTING TO CLIMATE CHANGE

Wellcome Room East: 10.00 - 12.00

Chair: Rajat Gupta, Oxford Brookes University

FORUM 14: DIGITAL DESIGN

Wellcome Room West: 10.00 - 12.00

Chair: Joe Clark, University of Strathclyde

FORUM 18: FUTURE CITY VISIONS

Lower Gallery: 10.00 - 12.00

Chair: Circe Monteiro, Federal University of Pernambuco, Recife

FORUM 21: CONSTRUCTION

Scott Room: 10.00 - 12.00

Chair: Phil Banfill, Heriot Watt University

FORUM 26: PLACE MAKING AND WELLBEING

James Clerk Maxwell Room: 10.00 - 12.00

Chair: Suzanne Ewing, University of Edinburgh

FORUM 30: VENTILATION

Swann Room: 10.00 - 12.00

Chair: Brian Ford, Natural Cooling Ltd.

BREAK 12.00 - 12.30

FORUM SESSION B: 12.30 - 14.30

ASSEMBLY ROOMS

FORUM 1: PASSIVE & CLIMATIC DESIGN

Music Hall: 12.30 - 14.30

Chair: Colin Porteous, Glasgow School of Art

FORUM 4: COMMUNITY ENERGY

West Drawing Room: 12.30 - 14.30

Chair: Andrew Peacock, Heriot Watt University

FORUM 5: OVERHEATING

East Drawing Room: 12.30 - 14.30

Chair: Samuel Dominguez-Amarillo, University of Seville

ROYAL SOCIETY OF EDINBURGH

FORUM 10: BRIDGING THE PERFORMANCE GAP

Wolfson Lecture Theatre: 12.30 - 14.30

Chair: Paul Touhy, University of Strathclyde

FORUM 12: ADAPTING TO CLIMATE CHANGE

Wellcome Room East: 12.30 - 14.30

Chair: Rajat Gupta, Oxford Brookes University

FORUM 14: DIGITAL DESIGN

Wellcome Room West: 12.30 - 14.30

Chair: Joe Clark, University of Strathclyde

FORUM 19: TRANSITION COMMUNITIES

Lower Gallery: 12.30 - 13.50

Chair: Keith Baker, Glasgow Caledonian University

FORUM 21: CONSTRUCTION

Scott Room: 12.30 - 14.30

Chair: Phil Banfill, Heriot Watt University

FORUM 24: TRANSPORT

Lower Gallery: 13.50 - 14.30

Chair: Harald N. Røstvik, University of Stavanger

FORUM 27: HEALTH AND AIR QUALITY

James Clerk Maxwell Room: 12.30 - 14.30

Chair: Grainne McGill, Glasgow School of Art

FORUM 31: WINDCATCHERS AND WINDOWS

Swann Room: 12.30 - 14.30

Chair: Sue Roaf, Heriot Watt University

BREAK 14.30 - 15.00

WEDNESDAY 5TH JULY

PLENARY SESSION 6: 15.00 - 16.00

PLENARY 6: RE-THINKING REGULATION

15.00 - 16.00 MUSIC HALL, ASSEMBLY ROOMS

15.00 - 15.30 **Standards ? Whose Standards?**
Elizabeth Shove, Lancaster University

PLEA 2017: CONCLUSIONS

15.30 - 15.45 **Awarding CIBSE Scotland Prizes**
Karen Warner, President CIBSE Scotland
Awarding SBSE Prizes
Ulrike Passe, President SBSE
Awarding PLEA 2017 Prize
Harvey Bryan, Arizona State University

15.45 - 16.00 **Invitation to PLEA2018 in Hong Kong**
Edward Ng, President of PLEA, Convenor of PLEA 2018

Conference summary and where to next
Susan Roaf, Convenor and Organiser of PLEA 2017

Thanks and goodbye from Team Scotland
Louise Batchelor, Conference Chair



ONLINE INFORMATION

All the information in this programme is published online at www.plea2017.net. Here you can find an interactive timetable and further information about individual presentations.

All papers presented at the conference are published in the Proceedings. These are available online on the PLEA 2017 website www.plea2017.net



FOLLOW UP

PLEA 2018 is being hosted in Hong Kong. For more information, please contact:
Professor Edward Ng, Chinese University of Hong Kong, President of PLEA and Convenor of PLEA 2018.

The organisers of PLEA 2017 cordially invite all participants for their feedback and thoughts inspired by this conference. Please email: legacy@plea2017.net

USEFUL CONTACTS

A list of delegates to PLEA 2017 can be found online at www.plea2017.net

For matters concerning particular forums:
Contact the individual Forum Chair

For matters concerning the venues:
Assembly Rooms: 0131 220 4348
Royal Society of Edinburgh: 0131 240 5000

PLEA 2017 KEYNOTE SPEAKERS



GEORGE BAIRD

Emeritus Professor of Building Science at the School of Architecture, Victoria University of Wellington, George Baird, FCIBSE, FIPENZ, gained his PhD in Engineering from Glasgow University and attended the National College for HVR&F Engineering in London. He moved to New Zealand in 1975 to help set up the School in Wellington. He specialises in building environmental science, the energy efficient design and operation of buildings and overall building performance. His major books include: *Energy Performance of Buildings*, *Building Evaluation Techniques*, *Architectural Expression of Environmental Control Systems*, and most recently *Sustainable Buildings in Practice*, (Routledge, 2010).



LOUISE BATCHELOR

Louise Batchelor is a former BBC Correspondent now turned freelance journalist and speaker specialising in transport, the environment and communicating science. She began her career as a newspaper journalist but quickly moved onto radio and television and worked for the BBC for 30 years, starting on Radio Scotland when it was founded in 1978. She was a presenter and reporter on Reporting Scotland, Newsnight, Newsroom South East and numerous other programmes. Louise strongly supports 'green' issues and tries to live an environmentally-friendly lifestyle. She has log-powered central heating and gardens organically. She is also a director of the Fair Isle Bird Observatory, on the executive of the Partnership for Action Against Wildlife Crime and on the steering committee for her local community woodlands. Louise will be Chairing the opening and closing sessions of the Conference.



NEIL BAXTER

Neil Baxter is CEO of the Royal Incorporation of Architects in Scotland having previously been Deputy Editor of Architectural Design and principal of his own architectural/interpretation consultancy. Neil has taught at the Mackintosh School, and lectured widely, written for The Telegraph, Herald, Sunday Herald, Homes & Interiors and AJ and is a frequent media spokesman. He is author of many publications including *The Wee Green Book*, *a History of Glasgow Green* and has edited Glasgow's medieval history, *A Tale of Two Towns; A Life in Cities*, the autobiography of David Mackay and the follow-up volume *On Life and Architecture*. In 2016 he co-authored *Scotstyle: 100 Years of Scottish Architecture (1915-2016)* and edited *Adventures in Space*. In May 2008, he received Glasgow's Lord Provost's Award, in 2013 he was awarded the Royal Incorporation's Honorary Fellowship and in 2016 the Honorary Fellowship of the RIBA.



RAB BENNETTS

Rab studied at Edinburgh College of Art with Denise Bennetts with whom he set up Bennetts Associates in 1987. Now based in Edinburgh, London and Manchester, they are responsible for many pioneering projects such as the PowerGen Headquarters, Wessex Water Operations Centre, Hampstead Theatre, Edinburgh University's Informatics Forum, the Jubilee Library in Brighton, the New Street Square development in the City of London, the Royal Shakespeare Theatre, hotels in London and Amsterdam, Camden's new community building at King's Cross and commercial developments in the City of London. Their practice has won more than 140 awards and has been shortlisted for the Stirling Prize several times and is now leading the way in new thinking on the structure of architectural practice for the 21st century.



JOE CLARK

Joe Clarke is the Director of the Energy Systems Research Unit and BRE Centre of Excellence in Energy Utilisation at the University of Strathclyde in Glasgow. His research is focused on the role that energy systems simulation can play in helping to reduce energy demand, accelerate the take-up of renewable energy technologies, mitigate environmental impacts and improve human well-being. A major element of his research involves the development and dissemination of software tools for energy systems simulation, and the application of these in design, research and policy contexts.

PLEA 2017 KEYNOTE SPEAKERS



KRIS DE DECKER

In 2007, Chris De Decker created Low-tech Magazine, and in 2009, No-tech Magazine, which are blogs published in English, Dutch and Spanish. No and Low-tech Magazines refuse to assume that every problem has a high-tech solution. He is a research collaborator for the DEMAND Centre at Lancaster University, working on the future of offices. Chris also works with the Department of Search at the University of Utrecht which is an insert of artistic and informal searching at the Utrecht Science Park campus in the Netherlands. Co-author of the book *Energy in 2030*, and author of *Radiant Heat*, a book on simple and affordable ecological technology in the Netherlands, Chris also writes in-depth articles on science, technology, energy and environment in Belgium and Holland.



IHSAN FETHI

Professor Ihsan Fethi is Professor of Architecture at Amman Ahliya University in Jordan, with a Doctorate in Urban Conservation (Sheffield, 1978) and Bachelors in Architecture (Cardiff, 1968). He has published 12 books and over 50 research papers, founded 5 Colleges of Architecture across the Arab World and the Heritage Department at Baghdad Municipality (1983). He was Chairman of Baghdad School of Architecture in 1986-1991. A consultant to UNESCO, the Getty Conservation Institute, World Monument Fund and ICCROM. Professor Fethi is an expert on the cultural heritage in Iraq, Iraqi Art and Architecture as an historian and critic. He now works on salvaging works of antiquity destroyed by ISIS.



RICHARD HASSELL - WOHA

Richard co-founded WOHA with Wong Mun Summ in 1994 in Singapore, and together they built it into the internationally-acclaimed practice it is today. He graduated from the University of Western Australia in 1989, then gained a Masters from RMIT University, Melbourne in 2002. He lectures around the world, and is a visiting professor at the University of Western Australia. In 2016 WOHA launched a new book at the Venice Biennale, called *Garden City Mega City*, sharing strategies for the exploding tropical mega cities. In it WOHA demonstrates the power of integrating landscapes and energy flows in Virtuous Cycles within architectural and urban design, using many of their own projects for inspiration and as exemplars. They show that it is possible to improve the quality of life within high-density environments while significantly reducing their environmental, social and economic impacts.



DEAN HAWKES

Dean Hawkes is a British architect and award-winning academic. He studied at Regional College of Art and at Manchester and Clare College, Cambridge. From 1965 – 1995 he taught and researched at the Cambridge Department of Architecture where he was a founder member and, later, Director of the Martin Centre for Architectural and Urban Studies. He held the Chair of Architectural Design at the Welsh School of Architecture in Cardiff from 1995 – 2002. He has held numerous visiting professorships across the world. He is emeritus professor at Cardiff University and an emeritus fellow of Darwin College, University of Cambridge. Dean Hawkes was in practice with Stephen Greenberg as Greenberg and Hawkes creating acclaimed projects that won a number of RIBA Architecture Awards. He is known for his PLEA approach to design.



FIONA HYSLOP

Cabinet Secretary for Culture and External Affairs in the Scottish Parliament, with responsibility for Europe added in November 2014, her portfolio includes architecture and the built heritage. Her MA from Glasgow University was in Economic History and Sociology, and her graduate Diploma was in Industrial Textiles, prior to working in Edinburgh with Standard Life, eventually as Brand Development Manager. Ms Hyslop was elected a Lothians MSP in 1999, and currently serves as MSP for Linlithgow. In 2011, she was appointed Cabinet Secretary for Culture, Tourism and External Affairs.

PLEA 2017 KEYNOTE SPEAKERS



KARIN KAPPEL

Karin Kappel is an Architect MAA from Denmark and has been the Secretariat Leader of the Solar City Copenhagen association since 2004, an organisation set up to contribute to a sustainable and carbon-neutral energy supply through the development of solar energy systems in architecturally well-integrated solutions. Initially funded by the City of Copenhagen, the Secretariat became self-financing and thus independent by 2010. Over time, the organisation has established an extensive multi-disciplinary network of academics, professionals, and practitioners which is extremely active as a policy driver, communication hub, development enabler and knowledge bank in both national and international circles. Karin continues to lead this organisation and in 2015 co-wrote an acclaimed book on the achievements of a range of 'Green Solar Cities'; they are well on their way to fulfilling their ambitious target of installing 40 MW or 280,000 sqm of photovoltaic by 2025.



KEN-ICHI KIMURA

Emeritus Professor at the Advanced Research Institute for Science and Engineering at Waseda University, Professor Kimura is also a founding member of PLEA. Over a career at Waseda and MIT universities, he rose to be a pre-eminent pioneer of passive and low energy buildings in Japan, specialising in heating and cooling loads of buildings, passive solar systems, active solar systems, solar house design, energy conservation in buildings, thermal comfort, indoor air quality and visual environment and PV integration into building design. He is a distinguished member of many academic and professional societies including the Architectural Institute of Japan and the Japan Solar Energy Society and has been influential in many spheres including those of publication, conference organization and the construction of demonstration buildings.



RODDY LANGMUIR

Roddy is one of four Practice Leaders at Cullinan Studio with particular responsibility for design quality. Having worked in Scotland and Canada, Roddy joined Cullinan Studio in 1987 and has worked on a wide variety of projects in most sectors. In 1994 he won a RIBA Award for the design of his father's house at Avielochan in Scotland. Significant projects include the John Hope Gateway Visitor Centre in Edinburgh, the Centre for Mathematical Sciences at the University of Cambridge, Singapore Management University City Campus and the Shahat Garden City Masterplan for a carbon neutral town in Libya's Green Mountain Region. Currently Roddy leads the Cullinan team on the National Automotive Innovation Centre for Jaguar Land Rover, Tata and the University of Warwick, due for completion next year and set to re-energise cutting edge research and design for manufacturing in the Midlands.



ADRIAN LEAMAN

Adrian Leaman has been at the forefront of building evaluation studies for 30 years. He specialises in the management and application of feedback from building occupants about their needs and requirements. He carried out pioneering and influential research work on occupant health in buildings ('sick buildings') in the 1980s, and productivity studies in the 1990s. He has been managing director of Building Use Studies (BUS) since 1987. This has been combined with university teaching roles at several universities across the world, as well as project experience covering 600 commissions. A widely-cited author with over 150 publications, Adrian Leaman runs the popular website Usable Buildings (www.usablebuildings.co.uk) for the Usable Buildings Trust (founded 2004), a charitable trust which puts independent results from building performance studies into the public domain.



DAVID S MITCHELL

Director of Conservation, Historic Environment Scotland and for the Centre for Digital Documentation and Visualisation LLP. At Historic Scotland he oversees technical and scientific research and innovation, technical education, traditional materials and skills, climate change and applied conservation for 345 properties and collections in the care of Scottish Ministers with a Scottish technical team of 400. His PhD was on the Scottish architectural iron founding industry and he has been Managing Director of Heritage Engineering, specialising in the conservation of industrial heritage. He is an honorary lecturer at The University of Strathclyde on the conservation of Built Heritage master's course.

PLEA 2017 KEYNOTE SPEAKERS



EDWARD NG - PRESIDENT OF PLEA: HONG KONG

Professor Edward Ng is an Architect and Yao Ling Sun Professor of Architecture in the Chinese University of Hong Kong (CUHK). He obtained his PhD from Cambridge University and practised as an architect before becoming a professor. At CUHK, Edward Ng is a specialist in Green Building, Environmental and Sustainable Design and in Urban Climatology for City Planning. As an environmental consultant to the Hong Kong SAR Government, Edward developed the performance based daylight design practice note; the Air Ventilation Assessment (AVA) Technical Guidelines; and the Urban Climatic Maps for City Planning for the HKSAR Government. Among many of his research interests, he is collaborating with public health colleagues to investigate the impact of city design and climate change on urban living. He is an acclaimed architect with awards from many organisations including the RIBA and UNESCO, and in 2010, he received a Red Cross Humanitarian Award.



MATT PETERSEN

Elected in 2013 as Los Angeles first Chief Sustainability Officer, Matt Petersen is responsible for developing environmental initiatives across all city departments to create healthier neighbourhoods with cleaner air and water. As CEO at Global Green USA since 1994, he helped build one of the country's leading environmental organizations, pioneering the greening of schools, affordable housing, and cities, while advancing the market for solar energy, green buildings, and fuel efficient cars, air and water. TIME Magazine recognized Petersen and Global Green's leadership in helping New Orleans rebuild a more resilient and greener community after Hurricane Katrina. He is considered a 'Green All Star' by many and was the opening keynote speaker at PLEA 2016 in Los Angeles.



SUSAN ROAF

Sue Roaf (B.A.Hons, A.A. Dipl., PhD, ARB, FRIAS) is Emeritus Professor of Architectural Engineering at Heriot Watt University and an award winning author, architect, solar energy pioneer, and was an Oxford City Councillor for seven years. Her research covers windcatchers and nomadic architecture in Iran, Mesopotamian archaeology, photovoltaics, low carbon, resilient and sustainable design, material considerations in design and thermal comfort. She is known for her pioneering work on the solar and ecohouse, resulting in the internationally best-selling book *Ecohouse: A Design Guide* on the subject. Her other books include *Adapting Buildings and Cities for Climate Change* and *Benchmarks for Sustainable Buildings: How to design a Comfortable Building*. She worked with the Scottish Government and their Climate Adaptation team. Her recent awards include 2013 Top 6 - UK 'First Women' Awards as a 'Visionary' in the Built Environment.



HARALD RØSTVIK

Professor Harald N. Røstvik is a pioneer and a visionary of sustainable design. He trained at the School of Architecture, University of Manchester and since 1977, he has designed and researched sustainable buildings, communities and transportation systems in European, African and Asian climates. At the 1992 UN Rio Conference on Environment and Development, he was key to the legendary approach of the International Solar Energy Society (ISES), to highlight energy as a separate strand in the negotiations which it was not at the time. Harald Røstvik initiated the world's best electric vehicle incentives in Norway in 1988. He teaches Urbanism spec sustainability at University of Stavanger and at Bergen School of Architecture, while still in private practice. He has written eight books.



KAY SAVILLE-SMITH

Kay Saville-Smith is founder and director of the Centre of Research, Evaluation and Social Assessment (CRESA), New Zealand. She has undertaken extensive research into New Zealand housing markets, demand, sustainable and accessible housing and retirement villages, the residential building industry and neighbourhood design. Now leading the 'Life When Renting' research programme funded by the Ageing Well National Science Challenge, she is also researching into domestic decision making patterns building on her work on Finding the Best Fit – Housing, Downsizing and Older People in a changing Society: Resilient Communities – Doing Better in Bad Times; Good Homes (older people's repairs and maintenance needs in the context of ageing in place); Sustainable Neighbourhoods and social aspects of the Building Energy End-use Study undertaken by BRANZ. She is also a trustee for the Marlborough Sustainable Housing Trust.

PLEA 2017 KEYNOTE SPEAKERS



MATTHIAS SCHULER

Matthias Schuler gained his mechanical engineering degree from the University of Stuttgart and now lectures and teaches around the world, for instance at the Universities of Harvard, Stuttgart and Limerick. In 1992, he founded Transsolar in Stuttgart, Germany, now a leading provider of consulting services on developing sustainable design strategies for buildings. The firm has a strong technical basis, using highly sophisticated computational simulations (e.g., thermal, lighting) for concept validations. Schuler has worked with a large number of well-known architects in the field on high-profile projects. His design solutions are always innovative, validated by detailed analytical simulation studies. Recently his activities have also moved beyond the building scale and working on energy and comfort solutions at the urban master plan level, for example for the carbon-neutral Masdar development in Abu Dhabi.



ELIZABETH SHOVE

Elizabeth Shove is a Professor in the Sociology Department at Lancaster University, and co-director of the DEMAND Research Centre. Her recent research has been about how social practices change and about the implications of these dynamics for everyday life, energy demand and climate change. Recently she has worked on the role of standards and their impacts in normative and cultural regulation of office design, demonstrating that they are tending to result in particular high energy design types being legitimised and valued, whereas lower energy designs are being delegitimised, devalued and pushed to the periphery of the attention of commercial office designers.



ISABELLE TOLAND

Now a director of Aileen Sage Architects, Isabelle Toland has worked during her studies on several international residencies with Mario Cucinella in Paris, Shigeru Ban in Tokyo and artists in Beijing, Berlin and London. On returning to Australia, Isabelle worked as a senior designer with Neeson Murcutt Architects on numerous award winning projects including the Castlecrag House, winning the prestigious Robin Boyd Award in 2011. She has worked on a range of culturally sensitive community projects and whilst with Toland Architects, Isabelle Toland worked on a number of community and cultural facilities projects for indigenous groups from Western Australia, regional NSW and Queensland. She has also held a number of teaching posts at various universities in New South Wales. In 2016 she was the creative director for the highly acclaimed Australian Exhibition at the Venice Architecture Biennale.



ELLIE TONKS

Ellie works on innovation projects and knowledge management for the Urban Transitions theme at Climate-KIC, Europe's largest public-private innovation partnership addressing climate change mitigation and adaptation. Climate-KIC's Urban Transitions theme catalyses urban transformation through collaboration and system innovation across infrastructure, governance and investment. Ellie Tonks completed a BSc in Ecology and Conservation at the University of St Andrews. Passionate about sustainability, she went on to pursue a masters in Ecological Economics from The University of Edinburgh. As a researcher, she has worked on the topic of Net Impact for the Business@Biodiversity program with Sustain Value consultancy. Ellie Tonks was also a Young Leader in Scotland's 2050 Climate Group; a collection of young professionals commitment to accelerate Scotland's transition to a low carbon economy.



ALEX WILSON

Alex Wilson is president of the Resilient Design Institute, a U.S. organization working to enhance the resilience of buildings and communities. He is also the founder of Building Green, a highly respected, 30-year-old information company and consultancy focused on sustainable building. Alex Wilson is a widely published writer on topics of green building, energy, resilience, and the environment. He served on the national board of the U.S. Green Building Council from 2000 – 2005, and in 2008 he received the organization's Leadership Award for Education; in 2010 he received the second annual Hanley Award for Vision and Leadership in Sustainability.

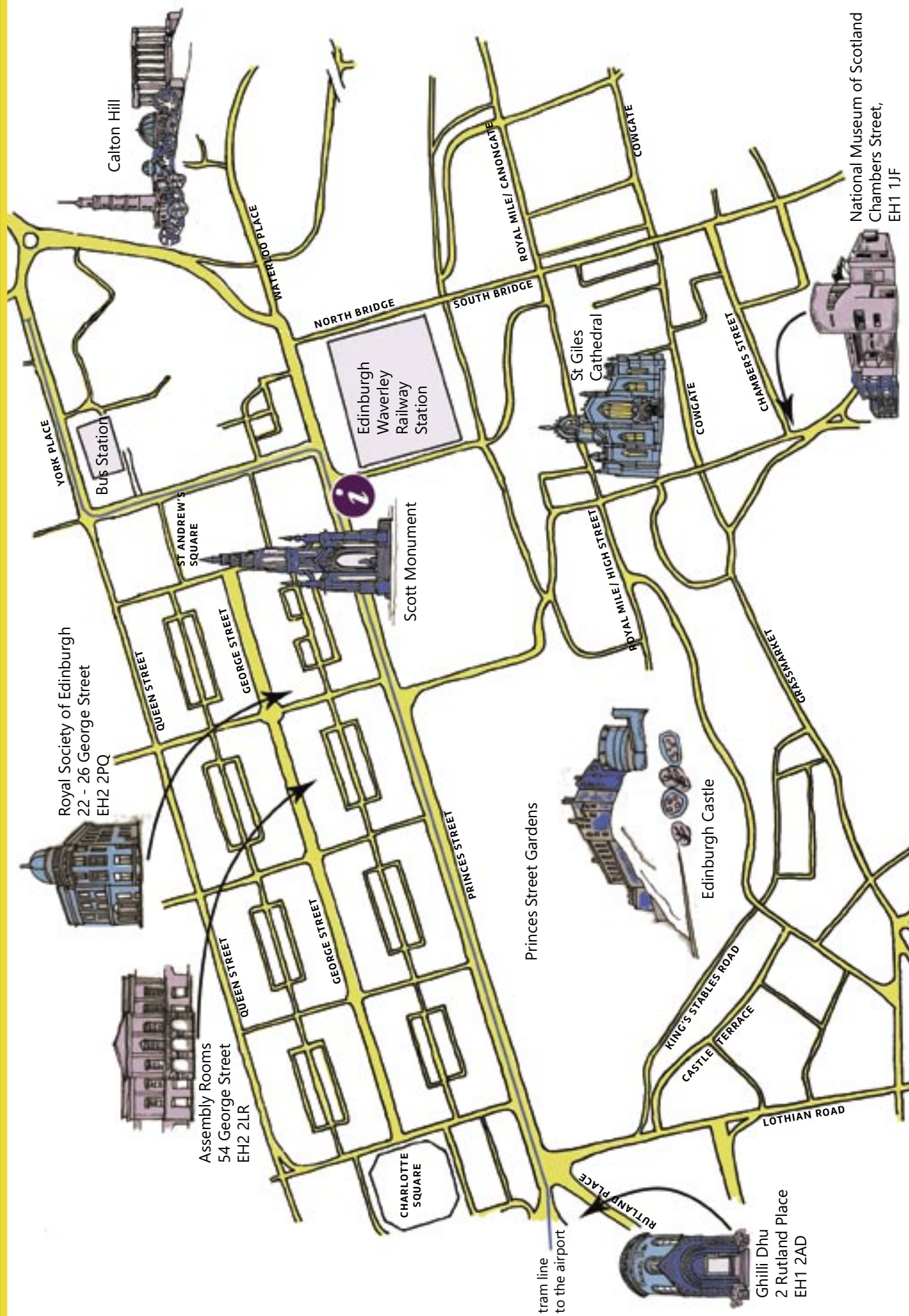


Thank you to everyone for supporting PLEA 2017 and so making this conference special and memorable. Please help us build a legacy for PLEA 2017 by contributing to our legacy page on the website www.plea2017.net

We hope you enjoy PLEA 2017.

Best wishes from

Sue Roaf and PLEA Team Scotland!



MAP OF EDINBURGH